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THE
ENGLISH FLORA.

VOL. IV.

CONTINUATION OF
SMITH'S ENGLISH FLORA.



DR. HOOKER is preparing for the Press the remaining Orders of *Cryptogamia*, to complete this Work ; which will be published early in 1830.

THE
ENGLISH FLORA,

BY
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STOCKHOLM, UPSAL, TURIN, LISBON, PHILADELPHIA, NEW YORK, ETC. ETC.;
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AND
PRESIDENT OF THE LINNÆAN SOCIETY.

“In genuinis differentiis specificis constat artis robur.”

Linn. Mant. 2. pref.

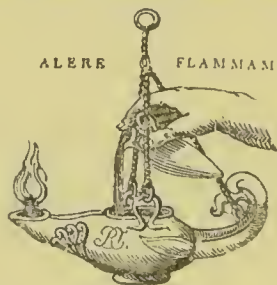
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ENGLISH FLORA.

Class XX. GYNANDRIA. *Stamens situated either on the style, or germen.*

Order I. MONANDRIA. *Stamen, or Sessile Anther, 1.*

* *Anther of 2 distinct vertical cells, fixed to the summit of the column.*

411. ORCHIS. *Nectary with a spur behind.*
412. ACERAS. *Calyx converging. Nect. without a spur, flat.*
414. OPHRYS. *Cal. spreading. Nect. without a spur, convex.*
413. HERMINIUM. *Cal. spreading. Petals with lateral lobes, like the nectary, which is flat without a spur.*

** *Anther parallel to the stigma, of 2 cells close together, permanent.*

416. NEOTTIA. *Cal. converging, embracing the base of the flat nectary, which is without a spur. Pet. converging. Column without wings.*

415. GOODYERA. *Cal.* spreading, embracing the base of the globose inflated *nectary*, which is without a spur. *Pet.* converging. *Column* without wings.

417. LISTERA. *Cal.* spreading. *Nect.* without a spur, nearly flat. *Pet.* spreading. *Column* without wings.

*** *Anther terminal, fixed.*

418. EPIPACTIS. *Nect.* without a spur; tumid underneath at the base; contracted in the middle; undivided at the end.

**** *Anther a terminal deciduous lid.*

419. MALAXIS. *Nect.* embracing the *column* with its concave base, without a spur, sessile. *Pet.* spreading.

420. CORALLORRHIZA. *Nect.* unconnected with the *column*, spurred or stalked at the base. *Pet.* spreading.

Order II. DIANDRIA. Stamens, or Sessile Anthers, 2.

421. CYPRIPIEDUM. *Calyx* and *Petals* spreading. *Nectary* inflated. *Column* with a terminal dilated appendage.

Order III. HEXANDRIA. Stamens, or Sessile Anthers, 6.

422. ARISTOLOCHIA. *Calyx* of 1 leaf. *Corolla* none. *Stigma* with 6 lobes. *Capsule* of 6 cells.

GYNANDRIA MONANDRIA and DIANDRIA.

The first and second Orders of this Class are perfectly natural, without any exception, or exclusion, comprehending the whole natural order of the *Orchis* tribe, and, as far as our knowledge at present extends, no other plant whatever. The cells of the *anther* being, in several instances, more or less distant from each other, Linnæus understood the whole tribe as diandrous; but Swartz and others have corrected this error, proved to be such by the near relations of these plants the *Scitamineæ*, the cells of whose *anther* are, in some instances, still more widely separated; in others full as decidedly united, so as to constitute a single *anther*. The analogy of other parts of the *flower* in that fine exotic order, with which Mr. Roscoe alone may be said to have made botanists familiar, will, if I mistake not, render us better acquainted with the same parts in the beautiful and favourite family of *Orchideæ*. I shall, in the first place, give its characters according to the ideas I have been induced to adopt from Nature herself, as well as from a careful study of the publications of Linnæus and Haller, compared with the transcendent improvements of Dr. Swartz and Mr. R. Brown.

Orchideæ. Linn. 7. Juss. 21. Br. Pr. 309. See *Grammar*, 81—84. f. 70—72, 77, 78.

Flowers all complete and perfect. *Embryo* simple, or, as it is usually expressed, monocotyledonous.

Calyx superior, of 3 leaves, either spreading or converging, sometimes coloured; the uppermost often vaulted; rarely extended at the base; 2 lateral ones opposite, equal; sometimes combined laterally, or dilated, or elongated, at the lower part; all either deciduous, or, more rarely, permanent.

Corolla likewise of 3 parts. *Petals* 2, interior, between the lateral and uppermost calyx-leaves, less than either, and almost always of a different substance and colour, ascending, or sometimes converging. *Nectary* a *lip*, in the same circle with the petals, projecting, or dependent, between the lateral calyx-leaves in front, often extended behind, beyond the calyx, in the form of one hollow

spur, rarely 2, various in length and acuteness, lodging the honey, which is otherwise produced by the smooth, furrowed, crested, or bearded, disk. The *nectary* therefore strictly answers to the Linnæan definition, "as a part of the corolla," and supplies the place of a third petal.

In some foreign *Orchideæ* it bears a stalked appendage.

Stamens gynandrous, partially imperfect. *Filaments* 3, united to the *style*, or *column*, above the *germen*, within the uppermost calyx-leaf, opposite to the lip; the 2 lateral ones almost always abortive, and hardly discernible; though these alone are perfect in *Cypripedium*, where the third, or uppermost, is wanting. *Anther*, in *Gynandria Monandria*, solitary, from the intermediate filament, of 2 cells, which are either widely separated, each cell at one side of the *column*; or brought together into a simple vertical *anther*, either parallel to the stigma, and lying over it, fixed, and permanent; or terminating the *column* in the form of a lid, which is moveable, attached by a sort of hinge at the back, and finally deciduous; each of its two cells being divided internally, by one, seldom three, longitudinal partitions. *Pollen* either of simple grains, or of fourfold globules, in masses fitting the cells. These masses, in the fixed divided anther, rarely in the terminal moveable one, or lid, consist of many angular portions, cohering by elastic *gluten*; in the parallel anther, rarely in the terminal one, they are rather powdery, forming plates of easily separable granulations; in the lid-shaped anther they are usually waxy, homogeneous and smooth. When the cells open, the discharged *pollen-masses* stick by a taper base, or elastic thread, to the *stigma*, or to some adjoining glandular bodies above it, or to any thing else in their way.

Germen altogether inferior, either roundish, obovate, or oblong, often twisted, having 3 principal ribs or angles, each opposite to a calyx-leaf. *Style*, technically called in this tribe a *column*, stout, more or less united with the *filaments*, and bearing the *anther*, or *anthers*; sometimes very short and thick. *Stigma* on the upper part of the style in front, facing the lip, either a mere concave moist depression, or protuberant, and often quadrangular; it is accompanied at the summit or sides by one or two glands, serving to attach the discharged pollen, and these are either naked, or contained in a membranous pouch, or pouches.

Capsule shaped like the germen, of one cell, and three valves, splitting between the fixed ribs, generally at both sides of each valve; rarely pulpy internally; *receptacles* three, attached longitudinally to the centre of each valve.

Seeds very numerous, minute, roundish, each enveloped in a large, loose, membranous *tunic*, wanting in the exotic *Vanilla* only, where they are imbedded in pulp; *albumen* the shape of the seed; *embryo* minute, simple, central, near the *scar*.

Our British *Orchideæ* are all herbaceous; with either tuberous or stoutly fibrous *roots*, seldom if ever parasitical. Their *stem* is simple, naked, or partly leafy; *leaves* simple, undivided, entire, smooth, and sleek; sheathing or sessile; *flowers* in a simple spike or cluster, which is rarely downy, glandular, or viscid; each flower accompanied, at the base of its partial stalk if there be any, by a solitary *bractea*. Some are highly fragrant, particularly in an evening, and many are very beautiful as well as singular. The tuberous *roots* abound in glutinous matter, and are generally esteemed nourishing and stimulating, making the *Salap* of the Turks. We must leave to conjecture the origin of this opinion.

The integuments of the *flower* in this family have never been understood as above described, by any preceding writer. Linnæus considered the whole as a *corolla*, consisting of 5 *petals* and a *nectary*. Swartz calls the former a *calyx* of 5 leaves, and the latter a *corolla*, of a single *petal*, or *lip*. Jussieu and the botanists of his school, denying the existence of a *corolla* in any monocotyledonous plant, and rejecting the Linnæan term *nectarium*, call the whole a *calyx* of six divisions. But if a *corolla* be allowed to exist in nature at all, it surely cannot be denied to these plants; any more than to the *Scitamineæ*, far better known at present than when Jussieu's immortal work appeared in 1789. These evidently settle the question. See *Grammar* 79. *f.* 1. If we will not allow them to have a *corolla*, we may, with equal propriety, deny the existence of such an organ in all herbs, or in all trees, or in any one natural order according to our whim or fancy. The *Orchideæ*, rightly understood, will be found as conclusive on the same side as the *Scitamineæ*, and they may possibly afford additional evidence of a *corolla* in monocotyledonous genera.

Perhaps the most ingenious and important remark, in phy-

siological or systematic botany, that has been made in our days, though I am by no means certain with whom it originated, relates to the numerical difference in the parts of fructification between the *monocotyledones* and *dicotyledones*. In the former, these parts are regulated by the number 3 or its compounds; in the latter by 5. The exceptions in each case, consisting of partial suppressions, or subtractions, relative to some part or other, follow the same rules. Thus one third is suppressed in the *styles* or *stigmas* of Grasses and some *Calamariæ*; one fifth in the *calyx*, *corolla* and *stamens* of some *Bicornes*, and other *dicotyledones* naturally decandrous; witness *Erica*, *Vaccinium*, *Epilobium*, &c. In *Scitamineæ* and *Orchideæ* rudiments of 2 abortive *stamens* are observable, indicating a suppression of two thirds; in *Cypripedium* indeed, which has 2 perfect *stamens*, only one third is wanting in those parts. The *Orchideæ* are universally allowed to be monocotyledonous, or as some say acotyledonous, which makes no real difference. Their parts of fructification are therefore governed by the number 3, not 5. It is contrary to every analogy to suppose they have either 5 calyx-leaves, or 5 petals; with a solitary organ which, to avoid the use of the Linnæan term *nectary*, is called a *lip*, though this organ secretes and contains honey. But to take the 3 outer leaves of the flower for a *calyx*, and the other 3, (which are alternate therewith, as well as ranged in an interior circle,) for the *corolla*, composed of 2 *petals* and a *nectary*, the last being most correctly a part of the *corolla*, appears to me perfectly intelligible and consistent. My distinguished friends Professor de Jussieu and Mr. Brown, from whose enlarged views the world has derived so much instruction, will, I am confident, pardon me if a search after truth leads me here to differ from them. The latter has indeed, in the *Hortus Kewensis*, so far altered the theory he originally adopted from Jussieu, as to term *corolla* in these plants, what he had called *perianthium*, and the candour of such an alteration does him the highest honour. The most eminent botanists have differed no less widely in the foundation of their generic distinctions of *Orchideæ*. Linnæus takes his characters chiefly from the form of the *nectary*, and especially of its posterior termination, without adverting to the *anther*. Haller first noticed the differences in this latter part, of which however he by no

means formed correct ideas ; for like Linnæus he considered all these plants as diandrous. Neither are his distinctions between his principal genera, *Orchis* and *Epipactis*, clearly conceived or intelligibly defined. The latter is a most heterogeneous assemblage. His treatment of the subject displays, nevertheless, an able mind, perceiving, and laboriously contemplating, difficulties which he could not conquer. Dr. Swartz first accurately understood the structure of the *anther*, and happily divided the *Orchideæ* into natural sections, according to the different shapes and positions of that part: taking further characters of the genera from those of Linnæus. Mr. R. Brown, in his *Prodromus Floræ Novæ Hollandiæ*, and in the second edition of Mr. Aiton's *Hortus Kewensis*, has revised the whole order with his accustomed learning and accuracy, so as to confirm and illustrate the genera of Swartz, adding many new ones from the ample stores of New Holland, and strengthening the whole by characters derived from the texture or consistence of the *masses of pollen*, (the *anthers* of authors antecedent to Swartz,) in which substance Haller had remarked differences, without turning them to account in practical arrangement. Mr. Brown has derived further assistance from the presence or absence of certain little pouches or cells, enclosing glands or tubercles, to which the *pollen-masses* attach themselves, near the *stigma*. I by no means doubt the use of these minute parts in scientific discrimination, provided neither they, nor any other, be allowed to overrule or contradict nature. But I do not find it necessary to resort to what is obscure or difficult, when I can derive clear, constant and natural characters, from parts more easy of examination. Even the position of the *calyx* and *petals*, whether spreading or converging, is unquestionably of great importance in this family. Whether, by the obvious and intelligible distinctions of genera to which I have resorted, I have made the study of this beautiful and interesting family satisfactory, those who follow me must decide. I wish the practical student of nature alone to be my judge; nor shall I be flattered by a blind or implicit adoption of my ideas, without examination.

Further remarks and illustrations will occur as we proceed with the history of our British genera and species.

GYNANDRIA MONANDRIA.

* *Anther of 2 distinct vertical cells, fixed to the summit of the column.*

411. ORCHIS. Orchis.

Linn. Gen. 461. *Juss.* 65. *Fl. Br.* 918. *Tourn. t.* 247. A, B. *Lam. t.* 726.

Satyrium. Lam. t. 726.

Habenaria. Willd. Sp. Pl. v. 4. 44. *Br. Pr.* 312.

Cal. superior, of 3 ovate, slightly concave, nearly equal, spreading or converging, ribbed, partly coloured, leaves. *Pet.* 2, oblong, smaller than the calyx, ascending, or converging. *Nect.* a roundish or oblong lip, entire, or mostly lobed, larger than the petals, dependent in front, betwixt the lower calyx-leaves; extended more or less, behind, in the form of a tubular *spur*, containing the honey, and pervious at its origin. *Anther* of 2 oblong membranous cells, either close together, or widely separated, opening lengthwise in front, above the *stigma*, and depositing their obovate, stalked, granulated, elastic *masses of pollen*, by their stalks, upon 1 or 2 glands, either naked or contained in one common hood, near that organ. *Germen* oblong or nearly cylindrical, furrowed, spirally twisted. *Style* thick and short. *Stigma* a shining moist depression, in front, under, or between, the masses of pollen. *Capsule* oblong, spiral. *Seeds* very numerous, oval, each in a light chaffy *tunic*, extended at both ends. *Roots* doubly tuberous, fleshy, either globular or palmate, whitish, internally viscid, with thick, fibrous, superior *radicles*; each *knob*, or *tuber*, solitary, rarely in pairs, flowering but once, and that mostly in the season immediately subsequent to its formation. *Stem* solitary, leafy at the base. *Leaves* chiefly radical, spreading, elliptic-oblong, or lanceolate, ribbed, accompanied at the bottom by a few membranous scales, like abortive leaves; their upper surface often spotted with brown or black; under surface palest. *Fl.* numerous, spiked, purple, crimson, or whitish; in some highly fragrant. *Cal.* ribbed, coloured, as are frequently the *germen*, *common stalk*, and *bracteas*. *Natives* of meadows, groves, or open chalky downs.

* *Knobs of the root roundish, undivided.*

1. *O. bifolia*. Butterfly Orchis.

Knobs of the root oval, taper-pointed. Lip of the nectary lanceolate, entire, about half the length of its very long spur. Lateral calyx-leaves spreading downwards.

O. bifolia. *Linn. Sp. Pl.* 1331. *Willd. v. 4.* 10. *Fl. Br.* 918. *Engl. Bot. v. 1. t. 22.* *Curt. Lond. fasc. 6. t. 65.* *Dicks. H. Sicc. fasc. 3. 16.*

O. n. 1285. *Hall. Hist. v. 2. 146. t. 35. f. 2.*

O. bifolia altera. *Bauh. Pin.* 82. *Rudb. Elys. v. 2. 197. f. 2;* bad.

O. hermaphroditica bifolia. *Bauh. Hist. v. 2. 772. f.* *Raii Syn.* 380.

O. hermaphroditica; also *Testiculus psycodes*. *Ger. Em.* 211. *f. f.*

O. scirpius primus. *Dod. Pempt.* 237. *f.* *Dalech. Hist.* 1554. *f.*

Satyrion trifolium. *Fuchs. Hist.* 710. *f.* *Ic.* 408. *f.*

Testiculi species tertia. *Matth. Valgr. v. 2. 333. f. 2.*

T. species quinta. *Camer. Epit.* 625. *f.*

Testiculus vulpinus. *Best. Hort. Eyst. vern. ord. 7. t. 6. f. 1.*

T. vulpinus primus; also *Hermaphroditica secunda*. *Lob. Ic.* 178. *f. f.*

Habenaria bifolia. *Br. in Ait. Hort. Kew. v. 5. 193.* *Hook. Scot.* 252.

β. *Orchis bifolia*. *Fl. Dan. t.* 235.

O. alba bifolia minor, *calcar oblongo*. *Bauh. Pin.* 83. *Raii Syn.* 380. *Rudb. Elys. v. 2. 198. f. 3.* *Vaill. Par.* 151. *t. 30. f. 7.* *Segu. Veron. v. 2. 128. t. 15. f. 10.*

O. alba, *calcar longo*. *Bauh. Hist. v. 2. 771. f.*

O. flore albo minor. *Best. Hort. Eyst. æst. ord. 4. t. 5. f. 4.*

In groves and thickets; most plentiful in Beech woods.

β. On open heaths.

Perennial. *June.*

Knobs of the root each tapering into a fibrous point. *Stem* angular, about a foot high, often more. *Leaves* usually two, spreading, elliptical, 3 inches long, of a bright shining unspotted green; very rarely accompanied by a third, smaller and more upright. *Bractees* lanceolate, about as long as the *germen*, one to each flower, besides a few larger, scattered along the stem. *Flowers* numerous, in a rather loose spike, pure white, except a greenish tinge on the *lip* and *spur*. The latter is rather tumid towards the end. *Lip* linear-oblong, about the size of the *calyx-leaves*, straight. Cells of the *anther* widely separated, by the semicircular abrupt termination of the *style*. *Pollen-masses* yellow, club-shaped, erect, each attaching itself to a gland-like naked tubercle, at each side of the centre of the flower, but sticking likewise to various parts of the plant occasionally.

The glands which receive the *pollen* being separated, and naked, or destitute of any cell or pouch, afford the distinctive character

of Mr. Brown's *Habenaria*, which, with all deference to my candid and learned friend, one of the few who seek truth for its own sake, seems to me an unnatural division of the genus *Orchis*. Willdenow's *Habenaria* is of no account whatever, being founded merely on the presence of 2 abortive filaments, which he happened to observe in some species, and which are proper, more or less evidently, to the whole natural order, though never duly understood till Mr. Brown pointed them out.

O. bifolia exhales, in an evening, the scent of the sweetest honeysuckle. β differs merely in its smaller size. The figure in Vaillant, and several of the above synonyms, answer equally well to either variety.

2. *O. pyramidalis*. Pyramidal Orchis.

Knobs of the root oval. Lip of the nectary in three equal entire lobes, with two protuberances above; spur long and slender.

O. pyramidalis. Linn. *Sp. Pl.* 1332. Willd. v. 4. 14. *Fl. Br.* 919. *Engl. Bot.* v. 2. t. 110. Hook. *Scot.* 251. *Lond.* t. 106. *Jacq. Austr.* t. 266.

O. n. 1286. *Hall. Hist.* v. 2. 146. t. 35. f. 1.

O. purpurea, spicâ congestâ pyramidalî. *Raii Syn.* 377. t. 18. *Segu. Veron.* v. 2. 129. t. 15. f. 11.

O. parvo flore rubro, sive phœniceo. *Bauh. Hist.* v. 2. 764. f.

O. militaris montana, spicâ rubente conglomératâ. *Tourn. Inst.* 432. *Vaill. Par.* 151. t. 31. f. 38.

O. fœmina major. *Fuchs. Hist.* 556. f.

O. fœmina angustifolia. *Fuchs. Ic.* 318. f.

Cynosorchis latifolia, spicâ compactâ. *Bauh. Pin.* 81. *Rudb. Elys.* v. 2. 186. f. 3.

C. major. *Ger. Em.* 205. f. *Dalech. Hist.* 1556. f.

C. nostra major. *Lob. Ic.* 173. f.

C. tertia. *Dod. Pempt.* 235. f.

On grassy hills or banks, especially where the soil is chalky.

Perennial. *July*.

Knobs without any taper point. *Herb* of a bright unspotted green, with a silky gloss. *Stem* more leafy than the foregoing. *Leaves* lanceolate, channelled, acute. *Spike* of a dense pyramidal form, subsequently obtuse, all over of a rich crimson, occasionally milk white and peculiarly delicate, which variety Haller appears never to have seen. The lobes of the *lip* are very rarely not quite entire; *spur* slender, about the length of the slender, smooth and even *germen*. Cells of the *anther* close together. Two protuberances near the origin of the *lip*, in front, hollow underneath, are the essential mark of this elegant species. The *flowers* are more or less fragrant, even in the day-time.

3. *O. Morio*. Green-winged Meadow Orchis.

Knobs of the root oval. Lip of the nectary four-cleft, somewhat crenate; spur obtuse, ascending. Calyx many-ribbed, converging.

O. Morio. *Linn. Sp. Pl.* 1333. *Mant.* 485. *Willd. v. 4.* 18. *Fl. Br.* 920. *Engl. Bot. v. 29. t.* 2059. *Curt. Lond. fasc. 3. t.* 59. *Hook. Scot.* 250. *Fl. Dan. t.* 253.; not good.

O. n. 1282. *Hall. Hist. v. 2.* 143. *t.* 33; the small figure.

O. morio fœmina. *Bauh. Pin.* 82. *Raii Syn.* 377. *Vaill. Par.* 149. *t.* 31. *f.* 13, 14. *Segu. Veron. v. 2.* 125. *t.* 15. *f.* 7. *Rudb. Elys. v. 2.* 193. *f.* 4.

O. minor purpurea, et aliorum colorum, cum alis virentibus. *Bauh. Hist. v. 2.* 761. *f.*

Cynosorchis. *Brunf. Herb. v. 1.* 104. *f.*

C. morio fœmina. *Lob. Ic.* 176. *f.* *Ger. Em.* 208. *f.*

Testiculus morionis fœmina. *Dod. Pempt.* 236. *f.*

Testiculi species quarta. *Camer. Epit.* 624. *f.*

Triorchis serapias mas. *Fuchs. Hist.* 559. *f.* *Dalech. Hist.* 1554. *f.*

T. mas minor. *Fuchs. Ic.* 321. *f.*

In rather moist meadows and pastures, among short grass, frequent.

Perennial. *May, June*.

Knobs nearly globose, not pointed; one of them often a little removed from the other by a stalk. *Stem* clothed with leafy sheaths. *Leaves* lanceolate, of a rather dull unspotted green, somewhat glaucous; the under side paler and shining. *Spike* rather lax. *Bractees* lanceolate, membranous, partly purple, the length of the *germens*. *Fl.* scentless, purple; sometimes pale, or flesh-coloured; sometimes varying to crimson, or to a light violet; but the numerous green ribs of the *calyx-leaves* are equally strong in all the varieties. These 3 leaves converge over the column in a vaulted form, enclosing the *petals*. *Spur* blunt, rather shorter than the germen, curved upwards. *Lip* in 4 unequal lobes; the lateral ones largest, deflexed, mostly notched at the margins; the disk pale, dotted with purple. Cells of the *anther* close together. The masses of *pollen*, formerly taken for anthers, split each into two lobes.

4. *O. mascula*. Early Purple Orchis.

Knobs of the root oval. Lip of the nectary four-cleft, crenate; spur obtuse. Calyx-leaves three-ribbed; two lateral ones reflexed upwards.

O. mascula. *Linn. Sp. Pl.* 1333. *Willd. v. 4.* 18. *Fl. Br.* 920. *Engl. Bot. v. 9. t.* 631. *Curt. Lond. fasc. 2. t.* 62. *Woodv. t.* 90. *Dicks. II. Sicc. fasc.* 11. 14. *Hook. Scot.* 250. *Jacq. Misc. v. 2.* 375. *Ic. Rar. t.* 180. *Fl. Dan. t.* 457.

O. n. 1283. *Hall. Hist. v. 2.* 144. *t.* 33; the larger figure.

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O. morio mas, foliis maculatis. *Bauh. Pin.* 81. *Raii Syn.* 376. *Vaill. Par.* 150. *t.* 31. *f.* 11, 12. *Segu. Veron.* v. 2. 124. *t.* 15. *f.* 5. *Rudb. Elys.* v. 2. 191. *f.* 1. *Moris.* v. 3. 490. *sect.* 12. *t.* 12. *f.* 3.

O. morio, foliis sessilibus maculatis. *Bauh. Pin.* 82. *Rudb. Elys.* v. 2. 192. *f.* 2.

O. quinta. *Clus. Hist.* v. 1. 268. *f.*

O. major, tota purpurea, maculoso folio. *Bauh. Hist.* v. 2. 763. *f.*

O. mas angustifolia. *Fuchs. Hist.* 555. *f.* *Ic.* 317. *f.*

Cynosorchis morio. *Lob. Ic.* 176. *f.*

C. morio mas. *Ger. Em.* 208. *f.*

Testiculus quartus. *Matth. Valgr.* v. 2. 234. *f.* *Camer. Epit.* 624. *f.*

T. morionis mas. *Dod. Pempt.* 236. *f.* *Dalech. Hist.* 1552. *f.*

In pastures, groves and shady dells, plentifully.

Perennial. *April, May.*

Somewhat larger than the preceding, especially the roots.

Leaves chiefly radical, elliptic-lanceolate, sleek and shining, of a fine green, more or less stained with purplish black, though foreign authors describe what seems an unspotted variety; the under side is paler, as usual in this tribe. *Fl.* of a more uniform purplish crimson than the last; the disk of the *lip* in like manner whitish and spotted, with a fine downy surface. *Calyx-leaves* with 3 ribs, not distinguished by any green colour; the uppermost converging with the *petals* into a hood; the 2 lateral ones bent strongly upwards, and spreading. Cells of the *anther* close together, deep purple. Masses of *pollen* yellow, undivided. *Germen*, as well as *bracteas*, purple. *Spur* tumid, turned a little upwards. *Lip* unequally four-lobed, variously notched or toothed.

These *flowers*, though without scent, cannot but engage the attention of all who admire the charms of spring, and they mix with the Hare-bell, Cowslip, and Cuckoo-flower in country nosegays. They are probably what the Queen in Hamlet terms "Long-purples." The Rev. H. Davies has often found them perfectly white, nor did they change when transplanted.

5. *O. ustulata.* Dwarf Dark-winged Orchis.

Knobs of the root oval. Lip of the nectary four-lobed, rough with small points. Spur obtuse, not half the length of the germen. Calyx converging. Leaves lanceolate.

O. ustulata. *Linn. Sp. Pl.* 1333. *Willd.* v. 4. 20. *Fl. Br.* 921. *Engl. Bot.* v. 1. *t.* 18. *Dicks. H. Sicc. fasc.* 3. 17. *Hook. Lond.* *t.* 36. *Fl. Dan.* *t.* 103.

O. n. 1273. *Hall. Hist.* v. 2. 138. *t.* 28. *f.* 2.

O. pannonica quarta. *Clus. Hist.* v. 1. 268. *f.* *Pann.* 238. *f.* 236. *Raii Syn.* 377.

- O. parvis floribus*, multis punctis notatis. *Bauh. Hist.* v. 2. 765. f.
O. militaris pratensis humilior. *Tourn. Inst.* 432. *Vaill. Par.* 149.
t. 31. f. 35, 36. *Segu. Veron.* v. 2. 123. *t.* 15. f. 4.
O. muscæ corpus referens maculosa. *Lac. Pruss.* 183. *t.* 60.
Cynosorchis militaris pratensis humilior. *Bauh. Pin.* 81. *Rudb.*
Elys. v. 2. 189. f. 6.
C. minor panonica. *Ger. Em.* 207. f.

On dry open chalky downs.

Perennial. *June*.

Much smaller than any of the foregoing, the *stem* being, with us, rarely more than 3 or 4 inches high, scarcely leafy but in the lower part. The plates of Haller and the *Fl. Dan.* represent it about a foot in height. *Leaves* spreading, lanceolate, rather glaucous, without spots. *Spike* oblong, dense, obtuse, of numerous small *flowers*, whose dark converging *calyx-leaves*, and blackish dots on the *lip*, give them a scorched or burnt aspect. *Bractees* small, ovate, acute, coloured. The *spur* is deflexed incurved, blunt, scarcely above one third the length of the *germen*. *Lip* roughish with minute points, purplish, with a white disk, divided into 4 entire lobes, the 2 lower ones often having a small intermediate point, like the following species, to which this is more allied than to any of the preceding.

Merrett, in his *Pinax* 89, mentions a white-flowered variety, found near Chiswell, Berks.

6. *O. fusca*. Great Brown-winged Orchis.

Knobs of the root oval. Lip of the nectary five-lobed, dilated, rough. Spur obtuse, not half the length of the germen. Calyx converging, blunt-pointed. Leaves elliptic-oblong.

- O. fusca*. *Jacq. Austr.* v. 4. 4. *t.* 307. *Willd.* v. 4. 23. *Comp.*
ed. 4. 142. *Curt. Lond. fasc.* 6. *t.* 64. *Bicheno Tr. of L. Soc.*
v. 12. 29.
O. n. 1276. *Hall. Hist.* v. 2. 140. *t.* 31.
O. purpurea. *Huds. ed.* 1. 334.
O. militaris. *Engl. Bot.* v. 1. *t.* 16. *Fl. Dan.* *t.* 1277.
O. militaris β. *Fl. Br.* 923. *β* and *γ*. *Linn. Sp. Pl.* 1334.
O. militaris major. *Tourn. Inst.* 432. *t.* 247. f. B. *Vaill. Par.* 148.
t. 31. f. 27, 28. *Segu. Veron.* v. 2. 122. *t.* 15. f. 2.
O. moravica. *Jacq. Coll.* v. 1. 61. *Ic. Rar.* *t.* 182.
O. magna, latis foliis galeâ fuscâ vel nigricante. *Bauh. Hist.* v. 2.
759. f. bad. *Dill. in Raii Syn.* 378. *t.* 19. f. 2.
O. strateumatica. *Ger. Em.* 215. f. *Lob. Ic.* 184. f.
O. strateumatica major. *Bauh. Hist.* v. 2. 758. f. *Dalech. Hist.*
1559. f.
O. latifolia. *Besl. Hort. Eyst. æst.* 4. *t.* 4. f. 1.
O. latifolia altera. *Clus. Hist.* v. 1. 267. f.

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Cynosorchis militaris major. *Bauh. Pin.* 81. *Rudb. Elys. v.* 2. 187. f. 1.

On chalky bushy hills, and about woods, chiefly in Kent.

Near Greenhithe, Kent. *Gerarde.* About Rochester. *Curtis.*

Perennial. *May.*

Except its size, which is five times that of the last, this species comes nearer to that, in the structure of its *flower*, and hue of the *calyx*, than to any other. It is the largest and most magnificent *Orchis* of British growth; *O. hircina* perhaps excepted, which the present excels in colour. The *stem* varies in height from 1 to 2 feet, and is most leafy about the lower part. *Leaves* 4 or 5, spreading, elliptical, not ovate, of a full, bright, not glaucous, green, 3 or 4 inches long, and $1\frac{1}{2}$ or 2 in breadth. *Spike* cylindrical, rather dense, many-flowered. *Bractees* acute, seldom a quarter the length of the germen, though variable in size. *Calyx-leaves* ovate, concave, bluntly pointed, converging, somewhat connected in the lower part; marked externally with dark brown lines, and confluent spots; internally green. *Petals* linear-oblong, covered by the calyx, pink or purplish, speckled with a darker hue. *Lip* the colour of the petals, either pink or purple, sometimes light flesh-coloured, rough with prominent dark-coloured points; the disk pale, or whitish; the margin deeply four-lobed, with a small intermediate central point; the two lower lobes much the broadest, more or less toothed or crenate. *Spur* deflexed, obtuse, tumid, not half the length of the lip, or of the germen. Cells of the *anther* close together.

The *flowers* have no very remarkable scent, at least not constantly; but in drying the whole herb exhales a strong odour like that of *Asperula odorata*, or *Anthoxanthum odoratum*, which is equally observable in the two following. *Curtis* has not represented the *petals*, which may be seen in *Engl. Bot.* His plate is otherwise excellent.

7. *O. militaris.* Military Orchis.

Knobs of the root oval. Lip of the nectary five-lobed, downy; two middle lobes dilated, rounded. Spur obtuse, not half the length of the germen. Calyx converging, taper-pointed.

O. militaris. *Linn. Sp. Pl.* 1333. *Fl. Suec.* 310. *Willd. Sp. Pl.* v. 4. 22. *Fl. Br.* 922. *Bichenov Tr. of L. Soc.* v. 12. 31. *Wulf. in Jacq. Coll.* v. 2. 268. *Ic. Rar. t.* 598.

O. n. 1277. *Hall. Hist.* v. 2. 140. t. 28. f. 1.

O. galea et alis ferè cinereis. *Bauh. Hist.* v. 2. 757. f. *Raii Syn.* 378. *Cat. Pl. Angl.* 215.

O. latifolia, hiantæ cucullo, major. *Tourn. Inst.* 432. *Vaill. Par.* 148.

O. militaris majoris varietas. *Vaill. Par. t.* 31. f. 21.

- O. mas latifolia.* *Fuchs. Hist.* 554. *f.*
O. major. *Cord. Hist.* 128. 2. *f.*
O. strateumatica minor. *Ger. Em.* 216. *f.*
O. prima species Dodon quinta Matth. *Dalech. Hist.* 1550. *f.*
O. Oreades, trunco pallido, brachiis et cruribus saturatè rubescentibus. *Mer. Pin.* 85. *Bicheno as above.*
Cynosorchis latifolia, hiantè cucullo, major. *Bauh. Pin.* 80. *Rudb. Elys. v. 2.* 185. *f.* 1; very bad.
C. latifolia, hiantè cucullo, minor. *Bauh. Pin.* 81. *Rudb. Elys. v. 2.* 186. *f.* 4.
C. militaris minor. *Rudb. Elys. v. 2.* 188. *f.* 3.
C. majoris secunda species. *Lob. Ic.* 175. *f.*
Satyron mas. *Trag. Hist.* 778. *f.*
Testiculus quintus. *Matth. Valgr. v. 2.* 235. *f.*
Stendelwurtz. *Brunf. Herb. v. 1.* 103. *f.*
Gray Orchis. *Petiv. H. Brit. t.* 68. *f.* 9.

On chalky hills.

On hills by the Thames near Cawsham (Caversham) bridge a mile from Reading, and on several hills, on the other side the water, towards Wallingford; first observed by Mr. Brown. *Merrett, Ray.* At Streatley, between Reading and Wallingford, also at Pentley Hangings, Stoken Church, where Dr. Williams first found it. *Mr. Bicheno.*

Perennial. *May.*

Herb smaller in every part than the preceding. *Leaves* narrower, rather more lanceolate and acute. *Fl.* of a more slender and elongated form, especially their *calyx-leaves*, which end in longish taper points, and are directed more upwards. They are at first sight distinguished by their silvery ash-colour, and the total want of those dark ribs, or stains, which have given its name to *O. fusca*. The *lip* moreover is considerably elongated in the disk, and ends in two much less dilated, though variable lobes, reaching far beyond the small intermediate one, and of a crimson or purple hue, deeper than the *petals*. Wulfen has well described this *Orchis*, in Jacquin's *Collectanea*, and the figure, drawn I believe by him, in the *Ic. Rar.*, well represents its distinguishing characters, of which the tapering points and grey hue of the *calyx*, and the more elongated *lip*, contracted in the middle, are the most apparent. It has the same scent as the last while drying.

This is the Swedish *O. militaris*, intended by Linnæus as the type of that species, and appears not to be rare in various parts of Europe. I have traced its several varieties, in the grass-plats about Rome, so nearly to *O. fusca* on the one hand, and *O. tephrosanthos* on the other, see *Tour on the Continent, ed. 2. v. 2.* 312, that I have been disposed to trust to my own observation, rather than to those botanists, however skilful, who have never studied them growing. I think the difference is most satisfac-

tory between *O. fusca* and *militaris*. So Haller thought. The English botanist will now have materials upon which to found an opinion for himself.

8. *O. tephrosanthos*. Monkey Orchis.

Knobs of the root oval. Lip of the nectary downy, in five lobes; four of them equal, linear, entire. Spur obtuse, not half the length of the germen. Calyx converging, taper-pointed.

O. tephrosanthus. Villars Prosp. 16; excluding Haller's n. 1275.

Fl. Dauph. v. 2. 32. *Swartz Orch.* 15. *Willd. Sp. Pl.* v. 4. 21.

Bicheno Tr. of L. Soc. v. 12. 33. *Hook. Lond. t.* 82.

O. militaris. *Engl. Bot.* v. 27. t. 1873.

O. militaris ε. *Linn. Sp. Pl.* 1334.

O. n. 1277, *varietas prima*. *Hall. Hist.* v. 2. 141; *excl. the reference to Breynius*.

O. zoophora, *cercopithecum exprimens oreades*. *Column. Ecphr.* 319. t. 320. f. 2.

O. antropophora oreades altera Col. *Merr. Pin.* 85. *Bicheno as above*.

O. flore simiam referens. *Bauh. Pin.* 82. *Rudb. Elys.* v. 2. 184. f. 8.

Vaill. Par. 148. t. 31. f. 25. 26. *Segu. Veron.* v. 2. 27. t. 15. f. 9.

Tourn. Inst. 433. t. 247. f. A.

Cynosorchis alter. *Dod. Pempt.* 234. f.

C. major altera. *Ger. Em.* 205. f.

Satyrium mas. *Brunf. Herb.* v. 1. 104. f?

On chalky hills.

Found by Mr. Brown, between Wallingford and Reading. *Merrett*.

On Ridgway hill, near Mapledurham, Oxfordshire. *Dr. Lamb*.

Among bushes on the rising ground to the west of the great chalk-pit, near Caversham, facing the Thames. *Mr. Bicheno*.

Near Dartford, Kent. *M. Peet*.

Perennial. *May*.

Rather smaller than the last, with which its herbage otherwise accords. The *spike* and *bracteas* scarcely differ in the slightest degree from that species, any more than the pale, taper-pointed leaves of the *calyx*, or the almost linear, purplish *petals*. The only remarkable distinction is observable in the *lip* of the *nectary*, which is deeply divided into 4 linear, obtuse, equal and uniform, purplish segments, with a small intermediate point; all pale or whitish at the base, like the disk of the *lip* whence they originate, which is downy and dotted. From frequent examination of these plants growing, and not from neglect or inattention, I have, like Linnæus who studied them at Fontainebleau, long concluded them to constitute but one species, the varieties of *O. militaris* appearing to combine *O. tephrosanthos* with the very different *O. fusca*. I am still dubious with

regard to *tephrosanthos* and *militaris*, both which do indeed differ from *fusca*, in their taper-pointed *calyx*. They all three smell like Woodruff or Melilot in drying.

It is remarkable that Mr. Bicheno should have referred to *Engl. Bot. t. 1873* as the *militaris*. I have traced out this error, for which he is not responsible, and which Dr. Hooker has corrected. But it is still more remarkable that neither of these writers should have noticed Columna's excellent and original figure of *tephrosanthos*. The synonyms of these plants, and of some foreign species related to them, might still afford matter for a long and careful inquiry. I have endeavoured to be exact in the references belonging to our British species, and have found much to correct in the course of their examination. A white-flowered variety is exhibited by Dr. Hooker, as well as a highly curious monstrosity, in which there are two complete *nectaries* to one flower, with only two *calyx-leaves*, and no *petals*.

The *Orchis* of Breynius, *Cent. t. 42*, wrongly quoted by Haller as our *tephrosanthos*, copied in *Rudb. Elys. v. 2. 194. f. 9*, figured by Columna, *Ecphr. v. 2. t. 9*, and by Garidel, *t. 76*, is a very distinct species, *O. undulatifolia* of Bivona-Bernardi, *Cent. 2. 44. t. 6*. *Sm. Prodr. Fl. Græc. v. 2. 213*. The *O. longibracteata* of the same author, *Cent. 1. 57. t. 4*, is another very fine species, most allied to *O. fusca*, but distinct. Linnæus, very unaccountably, makes *t. 42* of Breynius a variety of his own *Ophrys insectifera*!

9. *O. hircina*. Lizard Orchis.

Knobs of the root globose. Lip of the nectary downy, in three linear segments; the middle one very long, twisted, notched at the end. Calyx converging.

O. hircina. *Scop. Carn. v. 2. 193*. *Swartz. Orch. 15*. *Willd. v. 4. 28*. *Comp. ed. 4. 143*. *Hook. Lond. t. 96*.

O. n. 1268. *Hall. Hist. v. 2. 135. t. 25*.

O. barbata foetida. *Bauh. Hist. v. 2. 756. f.* *Raii Syn. 376*. *Vaill. Par. 149. t. 30. f. 6*. *Deering Nottingh. 154 ?*

O. barbata odore hirci, brevior latioreque folio; also *longior angustioreque folio*. *Bauh. Pin. 82*. *Segu. Veron. v. 2. 121. t. 15. f. 1*. *Rudb. Elys. v. 2. 195. f. 1, 2*.

O. saurodes, vel scincophora Gemmæ. *Dalech. Hist. 1553. f.*

Satyrium hircinum. *Linn. Sp. Pl. 1337*. *Fl. Br. 927*. *Engl. Bot. v. 1. t. 24*. *Jacq. Austr. t. 367*.

Tragorchis, Testiculus hirci. *Dod. Pempt. 237. f.*

T. maximus, and T. mas. *Ger. Em. 210. f.*

Testiculus hircinus vulgaris. *Lob. Ic. 177. f.*

β. Fl. Br. 927.

Orchis barbata foetida minor, flore albo. *Raii Syn. 376. ed. 2. 236*.

18 GYNANDRIA—MONANDRIA. Orchis.

In pastures and bushy places on a chalky soil, but very rare.

Near Dartford, and in other parts of Kent. *Ray, Hooker.* On Box hill, Surrey. *Mr. Graves.* At the bottom of Clifton hill in April and the beginning of May; also in Colwick wood, Nottinghamshire. *Deering.* In very shady situations among shrubs, about the beginning of August, in the barony of Tullagh, county of Clare, Ireland. *Wade Pl. Rar. Hibern.* 65. The late Mr. Lewin pointed out this *Orchis* to me, at Darent, 2 miles from Dartford, in July 1791. The very early period of flowering, mentioned by Deering, renders his plant doubtful.

Perennial. *July.*

One of the finest of its tribe. I have counted above 60 *flowers* in one spike. The *knobs* of the *root* are almost globular, and very large. *Stem* from 2 to 3 feet high, hollow, leafy. *Leaves* light green, slightly glaucous, erect, elliptic-lanceolate, acute, varying in breadth. *Spike* rather lax, upright. *Bracteas* linear-lanceolate, acute, often longer than the flowers including their lip. *Fl.* from 20 to about 60, strongly, not pleasantly scented, dull in colour, but curious and singular in appearance. *Cal.* converging over the *petals*, its leaves ovate, concave, obtuse; green, spotted with dull purple internally. *Pet.* of the same colours, narrow, linear. *Lip* in 3 linear, curved, purplish lead-coloured segments; the lateral ones hardly extending beyond the calyx; middle one four times as long, variously twisted; notched or jagged at the end; *disk* pale, or white, downy, spotted with purple. *Spur* short and tumid, whence Linnæus was led to refer this plant to his very artificial genus *Satyrium*, though it naturally follows our four preceding species of *Orchis*, to each of which it has some mark of affinity. In all of them the *spur* is more or less tumid, and slightly cloven, at the point. Mr. Graves is recorded by Dr. Hooker as having sometimes found a *flower* with a double lip, as in the foregoing, and once a double spike of blossoms.

*** Knobs of the root tapering, clustered.*

10. *O. albida.* White Cluster-rooted Orchis.

Knobs tapering, clustered, undivided. *Lip* of the nectary in three deep acute lobes; the middle one largest; *spur* one-third the length of the germen.

O. albida. Swartz *Orch.* 20. Willd. v. 4. 38. Comp. ed. 4. 143. Wahlenb. Lapp. 216.

O. n. 1270. Hall. Hist. v. 2. 137. t. 26. f. 1.

O. pusilla alba odorata, radice palmata. Raii Syn. 381.

Pseudo-orchis alpina, flore herbaceo. Mich. Gen. 30. t. 26. f. A, B, C. Segu. Veron. Suppl. 254.

Satyrium albidum. Linn. Sp. Pl. 1338. Fl. Br. 929. Engl. Bot.

v. 8. t. 505. *Dicks. H. Sicc. fasc. 1. 15.* *Ehrh. Phytoph. 96. Fl. Dan. t. 115.* *Gunn. Norv. v. 2. 34.*

Habenaria albida. *Br. in Ait. H. Kew. ed. 2. v. 3. 195.* *Hook. Lond. t. 107. Scot. 252.*

β. *Orehis palmata*, thyrsos speciosos, longos, densè stipatos, ex viridi albentes. *Dill. in Raii Syn. 382.*

In grassy mountain pastures.

On Snowdon, by the road from Llanberris to Caernarvon. *Ray.*

On hills not far from the house, at Hafod, Cardiganshire. *Mr. Todd.* In dry hilly pastures of Argylshire, and in several of the Hebrides. *Lightfoot.* Plentiful in the mountainous parts of Yorkshire. *Hooker.*

β. In moist meadows, not only in Wales, but also about Malham, Yorkshire. *Dr. Richardson.*

Perennial. *June.*

Root of several, clustered, tapering, almost cylindrical, undivided knobs, with a few slender thread-shaped radicles, from above their common origin. *Mr. Sowerby* thought these knobs were perfected, and produced a flowering plant, in successive pairs; but *Dr. Wahlenberg*, whose opinion is adopted by *Dr. Hooker*, judged them to consist of two sets, each set being destined successively to bear a plant, like the knobs, whether globose or palmate, of other *Orehis*. These writers reckon about five knobs, which they term radicles in each cluster. The real radicles however, the essential part of a root, see *Introd. to Botany, chap. 12*, are very distinct, as pointed out by *Mr. Sowerby*, and are about four, thread-shaped, more slender than the knobs, which last appear to me to be usually, if not invariably, three in each cluster or set, formed one season, flowering the next, and withering afterwards entirely away. I have transplanted various roots of this species, but could never succeed in their cultivation. Stem seldom more than a foot high, leafy, hollow. Leaves light green, lanceolate, rather glaucous beneath; the lower ones broadest, and rounded at the end. Spike cylindrical, dense, of many small flowers, in which I have but seldom perceived any fragrance, though *Gunner* and *Ray* describe them as sweet-scented. Bractees ovate-lanceolate, bluntish, about the length of the germen. Calyx-leaves and petals ovate, concave, moderately converging, cream-coloured, all more alike in form, size and hue than in most of our British *Orchideæ*. Lip greener, about the same length, in 3 deep pointed lobes, the middle one largest, and sometimes bluntish. Spur incurved, short and thick. Pollen-masses cloven, their globules larger and more distinct than in undisputed species of *Orchis*. They appear, by *Dr. Hooker's* excellent plate, each to proceed from a hood or seale; but are understood by *Mr. Brown* to be naked, as they ought to be in his genus *Habenaria*.

I suspect β to be scarcely a variety, and that Dillenius, in this, as in many other instances, has introduced into his edition of the *Synopsis*, under a new name, what existed there already. The late Rev. Mr. Wood of Leeds thought he once found in Wales, early in summer, the *Orchis sambucina*, which I have supposed the *O. pusilla alba odorata* &c. of Ray might be. But we learn from Jacquin that *O. sambucina* is scentless, the smell of Elder belonging rather, as Mr. Davall noticed, to *O. pallens*, whose roots are globular.

11. *O. viridis*. Frog Orchis.

Knobs tapering, clustered, divided. Lip of the nectary linear, with three teeth; the middle one smallest. Spur very short, slightly cloven.

O. viridis. Swartz Orch. 19. Willd. v. 4. 33. Comp. ed. 4. 143. Wahlenb. Lapp. 216.

O. n. 1269. Hall. Hist. v. 2. 136. t. 26. f. 2.

O. palmata minor, flore luteo-viridi. Raii Syn. 381.

O. palmata, flore viridi. Bauh. Pin. 86. Prodr. 30. Rudb. Elys. v. 2. 216. f. 17.

O. palmata batrachites. Bauh. Pin. 86. Rudb. Elys. v. 2. 213. f. 10. Vaill. Par. 153. t. 31. f. 6, 7, 8.

O. palmata, odore gravi, ligulâ bifariam divisâ, flore viridi. Segu. Veron. v. 2. 133. t. 15. f. 18. t. 16. f. 18.

O. palmata, flore galericulato dilutè viridi. Læs. Pruss. 182. t. 59.

Satyrium viride. Linn. Sp. Pl. 1337. Fl. Br. 928. Engl. Bot. v. 2. t. 94. Fl. Dan. t. 77. Ehrh. Phytoph. 46. Dicks. H. Sicc. fasc. 4. 14.

Habenaria viridis. Br. in Ait. H. Kew. ed. 2. v. 5. 192. Hook. Lond. t. 130. Scot. 252.

Serapias batrachites altera. Ger. Em. 224. f.

S. batrachites vel myoides. Lob. Ic. 193. f.

Palmatæ cujusdam icon. Bauh. Hist. v. 2. 776. f.

In moist pastures and meadows, especially on gravelly or stony ground.

Perennial. June, July.

Knobs two or more, thick at their origin, but cloven and tapering below, accompanied by several cylindrical radicles. Ehrhart, among the fanciful Greek names in his *Phytophylacium*, calls this plant therefore *Diplorrhiza*; giving to the preceding the appellation of *Triplorrhiza*, understanding it as above described. The stem is commonly from 3 to 6 inches high, rarely taller, leafy. Leaves ovate or elliptical, deep green; the uppermost lanceolate, and acute. Spike rather lax. Bractees lanceolate, erect, leafy; the lower ones rising much above the flowers, which are for the most part green and inconspicuous, though twice the size of the last. Cal. green, tipped or bordered with brown, closely

converging over the green, much narrower, *petals*. *Lip* twice as long as the calyx, dependent, linear-oblong, ending in 2 sharp lobes, with a smaller central one; its disk greenish yellow; sides mostly brown; but the colour of the whole *flower* is variable. Cells of the *anther* brown, rather distant, with a naked gland at the base of each to receive the *pollen-masses*, consisting of large yellow granulations.

C. Bauhin and Rudbeck have noticed this *Orchis* twice. The *Serapias batrachites*, *Ger. Em.* 224. *f.* 8, *Orchis batrachoides*, *Daléch. Hist.* 1560. *f.*, must be a distinct species. It is *O. hermaphroditica*, *Bauh. Pin.* 83. *Rudb. Elys. v.* 2. 199. *f.* 6. The latter refers to *O. melittias*, *Ger. Em.* 213. *f.*, which surely cannot be the same. Systematic writers have not adverted to these synonyms, nor does any popular author appear to have met with either of Gerarde's plants.

*** *Knobs of the root palmate.*

12. *O. latifolia*. Marsh Palmate Orchis.

Knobs imperfectly palmate. *Lip* of the nectary convex, crenate, slightly three-cleft; spur conical. Bracteas longer than the flowers. Stem hollow.

O. latifolia. *Linn. Sp. Pl.* 1334. *Willd. v.* 4. 28. *Fl. Br.* 924. *Engl. Bot. v.* 33. *t.* 2308. *Curt. Lond. fasc.* 5. *t.* 65. *Hook. Scot.* 251. *Fl. Dan. t.* 266. *Wahlenb. Lapp.* 215.

O. n. 1279. *Hall. Hist. v.* 2. 142. *t.* 32. *f.* 2.

O. palmata pratensis latifolia, *longis calcaribus*. *Bauh. Pin.* 85. *Raii Syn.* 380. *Rudb. Elys. v.* 2. 211. *f.* 1. *Vaill. Par.* 152. *t.* 31. *f.* 1—5.

O. palmata palustris latifolia. *Bauh. Pin.* 86. *Rudb. Elys. v.* 2. 214. *f.* 12.

Palma Christi mas. *Ger. Em.* 220. *f.*

P. Christi erecta, *flore incarnato*. *Besl. Hort. Eyst. æst. ord.* 4. *t.* 5. *f.* 3.

Palmata non maculata. *Bauh. Hist. v.* 2. 774. *f.*

P. sive Serapias palustris latifolia, *flore albo subpurpurascente*. *Bauh. Hist. v.* 2. 775. *f.*

Serapias palustris latifolia. *Ger. Em.* 222. *f.* *Lob. Ic.* 190. *f.*

Satyrion latifolium. *Sweert, Floril. t.* 63. *f.* 7.

Cynosorchis palustris platyphylla. *Daléch. Hist.* 1562. *f.*

β. *Orchis palmata palustris tota rubra*. *Dill. in Raii Syn.* 382. *Bauh. Pin.* 86? *Rudb. Elys. v.* 2. 216. *f.* 16?

Palmata floribus impensè rubris. *Bauh. Hist. v.* 2. 777. *f.*

Cynosorchis Dracontias, *foliis et floribus impensè rubris*. *Lob. Ic.* 191. *f.*

In marshes, and moist meadows, abundantly.

Perennial. *May, June.*

Root irregularly and imperfectly palmate, the *knobs* not being so much divided as in most of this section; especially that destined to bear flowers in the ensuing season, which is later and smaller than usual. *Herb* various in size, luxuriance, breadth of leaves, and colour, having often a purple tint. *Stem* from one to two feet high, leafy, hollow. *Leaves* lanceolate, or somewhat ovate, unspotted, erect, gradually smaller upward. *Spike* dense, many-flowered. *Bracteas* linear-lanceolate, pointed, often purple; the lower ones much longer than the flowers; upper more or less so. *Fl.* varying from a pale flesh-colour, or white, to a full rose or crimson, the spreading *calyx* dotted, but otherwise of the same hue as the *petals* and *nectary*. *Spur* rather thick, conical, deflexed, shorter than the *germen*. *Lip* variously notched, generally somewhat three-lobed; its disk elegantly variegated with dark purple and white, deflexed at the sides.

Authors appear to have made several species out of this one. At least I could never ascertain more than one in Britain, to which all the above synonyms surely belong. The variety β has not been noticed since the time of Dillenius. Some Swiss specimens, though dried 30 years ago, retain much of a purple colour in their herbage, and what Dillenius has adopted from Gibson's edition of Cambden may have been either such a variety, or possibly a plant we shall speak of hereafter. See *Epipactis*, n. 2. Some of Vaillant's references regard *O. sambucina*, an alpine species, sufficiently distinct.

13. *O. maculata*. Spotted Palmate Orchis.

Knobs palmate, spreading. Lip of the nectary flat, crenate, three-lobed; spur cylindrical, rather shorter than the germen. Bracteas shorter than the flowers.

O. maculata. Linn. *Sp. Pl.* 1335. Willd. v. 4. 31. *Fl. Br.* 925. *Engl. Bot.* v. 9. t. 632. Hook. *Lond.* t. 112. *Scot.* 251. *Fl. Dan.* t. 933.

O. n. 1278. Hall. *Hist.* v. 2. 141. t. 32. f. 1.

O. fœmina altera. Trag. *Hist.* 781. f.

O. palmata pratensis maculata. Bauh. *Pin.* 85. Rudb. *Elys.* v. 2. 211. f. 3.

O. palmata palustris maculata; also *montana maculata*. Bauh. *Pin.* 86. Rudb. *Elys.* v. 2. 215. f. 15; and 217. f. 20.

O. palmata pratensis latifolia maculata, *calcaribus longis*. Vaill. *Par.* 152. t. 30. f. 15; also *montana maculata*. 153. t. 31. f. 9, 10.

O. palmata montana maculata. Segu. *Veron.* v. 2. 132. t. 15. f. 16, bad.

Palmata speciosiore thyrso, folio maculato. Bauh. *Hist.* v. 2. 774. f. Raii *Syn.* 381.

Palma Christi. Cord. *Hist.* 130. 2. f. Lob. *Ik.* 188. f.

P. Christi fœmina. *Ger. Em.* 220. *f.*

Satyrium basilicum fœmina. *Dod. Pempt.* 240. *f.* *Fuchs. Hist.* 713. *f.*

S. basilicum mas alterum. *Fuchs. Ic.* 410. *f.*

In meadows, pastures and woods, very common ; sometimes on dry, barren, or heathy, ground.

Perennial. *June, July.*

Roots distinctly palmate, with several long, spreading, slender lobes, resembling the true radicles. *Stem* nearly or quite solid, leafy. *Leaves* lanceolate, keeled, all copiously stained with blackish spots. *Spike* short, dense, conical. *Bractees* scarcely so long as the germen, green, or but slightly purplish. *Fl.* variable in size, pale purple, or white, variously besprinkled with dark purple, or violet, streaks and dots. *Cal.* spreading, as much coloured as the *corolla*. *Lip* flat, with 2 large, rounded, crenate side-lobes, and a sharp intermediate point. *Spur* scarcely shorter than the *germen*, more slender and cylindrical than the last. *Anther* purplish, with green *pollen*.

14. *O. conopsea*. Aromatic Palmate Orchis.

Knobs palmate. Lip of the nectary in three entire equal lobes ; spur very slender, twice as long as the germen. Calyx widely spreading.

O. conopsea. *Linn. Sp. Pl.* 1335. *Willd. v.* 4. 32. *Fl. Br.* 926. *Engl. Bot. v.* 1. *t.* 10. *Dicks. H. Sicc. fasc.* 4. 13. *Forst. Tonbr.* 100. *Fl. Dan. t.* 224. *Wahlenb. Lapp.* 215.

O. n. 1287. *Hall. Hist. v.* 2. 147. *t.* 29. *f.* 2.

O. palmata minor, *calcaribus oblongis*. *Bauh. Pin.* 85. *Rudb. Elys. v.* 2. 212. *f.* 5. *Vaill. Par.* 153. *t.* 30. *f.* 8. *Segu. Veron. suppl.* 251. *t.* 8. *f.* 7.

O. palmata angustifolia minor. *Bauh. Pin.* 85. *Rudb. Elys. v.* 2. 212. *f.* 6.

O. palmata montana maxima. *Bauh. Pin.* 86. *Prodr.* 31. *f.* *Rudb. Elys. v.* 2. 216. *f.* 18.

O. palmata pratensis angustifolia major. *Bauh. Pin.* 85. *Prodr.* 30. *f.* 1.

O. palmata caryophyllata. *Bauh. Pin.* 86. *Rudb. Elys. v.* 2. 213. *f.* 8.

O. palmata angustifolia minor odoratissima. *Rudb. Elys. v.* 2. 213. *f.* 7 ; but not that of Bauhin, which is *O. odoratissima* *Linn.*

O. fœmina. *Trag. Hist.* 780. *f.* not the description.

O. serapias caryophyllata. *Lob. Ic.* 194. *f.*

Orchis. *Tillands Ic.* 67. *f.*

Palmata rubella, cum longis *calcaribus rubellis*. *Bauh. Hist. v.* 2. 778. *f.* *Raii Syn.* 381.

P. caryophyllata. *Bauh. Hist. v.* 2. 777. *f.*

Palma Christi major. *Matth. Valgr. v.* 2. 237. *f.* *Camer. Epit.* 626. *f.*

24 GYNANDRIA—MONANDRIA. *Aceras*.

P. Christi alia. *Cord. Hist.* 130. 2. f.

Satyrium basilicum mas. *Fuchs. Hist.* 712. f. *Ic.* 409. f.

S. foemina. *Brunf. Herb.* v. 1. 106. f.

Serapias minor, nitente flore. *Ger. Em.* 222. f.

S. gariophyllata. *Ger. Em.* 223. f.

Gymnadenia conopsea. *Br. in Ait. H. Kew. ed. 2. v. 5.* 191. *Hook. Scot.* 251.

In rather moist meadows and pastures, especially in hilly countries. Perennial. *June*.

Root distinctly palmate, with many long and slender divisions.

Herb of a bright unspotted green, variable in luxuriance. *Stem* generally about 18 inches high, leafy, hollow. *Leaves* lanceolate, often nearly linear, acute. *Spike* cylindrical, rather lax, many-flowered. *Bracteas* ovate, taper-pointed, not much longer than the *germen*. *Fl.* of a uniform crimson in every part, without spots, smaller than most of the genus, exhaling a most powerful and delicious odour, resembling that of a Clove Pink. They are now and then found white. Lateral leaves of the *calyx* widely spreading. *Petals* slightly converging along with the upper calyx-leaf, and nearly the same size. *Lip* of the *nectary* minutely downy, in three uniform, equal, entire, rather deep, flat lobes; *spur* about twice as long as the *germen*, pointing downwards, or occasionally curved upwards, cylindrical, acute, very slender. *Anther* crimson.

Caspar Bauhin, and other botanists of his time, have made several truly futile species out of this. *O. odoratissima* of Linnæus is the only plant likely to be confounded with it; but the *leaves* of that are still narrower, and the blunt recurved *spur* is not longer than the *calyx*. This is represented in Bauhin's *Prodr.* 30. f. 2; but Rudbeck's 213. f. 7, intended for it, is *O. conopsea*.

Mr. Brown has observed the glands which receive the *pollen* to be naked, or destitute of the hood, or slight covering, proper to his genus *Orchis*. On this character he founds his *Gymnadenia*, so named from these *naked glands*. But the plant in question has so strong a generic affinity to several which are furnished with this hood, especially *O. pyramidalis*, that it appears to me a most striking confirmation of the important principle of Linnæus, *genus dabit characterem, non character genus*. An eminent French botanist it seems is pursuing these subdivisions still further; so that, as Dr. Hooker has observed to me, we may soon have nearly as many genera in *Orchideæ* as there are species.

412. ACERAS. Man-orchis.

Brown in Ait. H. Kew. ed. 2. v. 5. 191. *Comp. ed.* 3. 128. *ed.* 4. 141. *Prodr. Fl. Græc.* v. 2. 215.

Ophrys. *Lam. t.* 727. f. 2.

Cal. superior, of 3 ovate, concave, equal, closely conver-

ging, ribbed, permanent leaves. *Pet.* 2, linear-oblong, the length of the calyx, which conceals them. *Nect.* a lip without a spur, dependent, much longer than the calyx, linear-oblong, with 4 linear, obtuse, entire lobes, the 2 uppermost longest; the disk linear, flat and even. *Anther* of 2 oblong membranous cells, close together, above the stigma, depositing the obovate, stalked, granulated, elastic masses of *pollen*, by their stalks, upon two glands, "contained in one common hood;" *Brown*. *Germen* oblong, furrowed, nearly straight. *Style* very short. *Stigma* a moist depression in front. *Caps.* obovate, slightly curved, furrowed. *Seeds* very numerous, tunicated.

Root of two successive ovate woolly knobs, with woolly *radicles*. *Herb* smooth. *Stem* solitary, leafy at the base. *Leaves* elliptic-oblong, enveloped below in a membranous sheath. *Fl.* numerous, spiked. *Cal.* ribbed, green or brownish. Found in chalky fields and pastures.

The want of a spur distinguishes this plant from *Orchis*, with which genus it otherwise most naturally agrees. From *Ophrys* Mr. Brown separates it by the *hood* of its glands being single, which, confirmed by the habit, is here unquestionably important. I nevertheless prefer more obvious, and no less certain, characters, founded on the converging *calyx* and long flat *lip*.

1. *A. anthropophora*. Green Man-orchis.

Lip longer than the germen.

A. anthropophora. *Br.* as above, 191. *Comp. ed.* 4. 143.

Ophrys anthropophora. *Linn. Sp. Pl.* 1343. *Willd. v.* 4. 63. *Fl. Br.* 937. *Engl. Bot. v.* 1. t. 29. *Curt. Lond. fasc.* 6. t. 66. *Dicks. H. Sicc. fasc.* 15. 16.

Orchis n. 1264. *Hall. Hist. v.* 2. 133. t. 23.

O. anthropophora oreades. *Column. Ecphr.* 318. t. 320. f. 1. *Raii Syn.* 379. *Garid. Prov. t.* 77.

O. flore nudi hominis effigiem repræsentans, fœmina. *Bauh. Pin.* 82. *Rudb. Elys. v.* 2. 193. n. 7. f. 6. *Vaill. Par.* 147. t. 31. f. 19, 20. *Garid. Prov.* 340. t. 77.

In chalk-pits, grassy pastures, and on banks by the road side, on a chalky soil.

Frequent in Kent. *Huds.* At Ashwelthorpe, near Norwich. *Mr. Crowe.* At Fornet, Norfolk. *Mr. Joseph Fox.* In and about a chalk-pit at Ickworth, near Bury, among grass, copiously.

Perennial. *June*.

Root as above described. *Herb* light green, smooth and shining.

26 GYNANDRIA—MONANDRIA. Herminium.

Stem 12 or 15 inches high, bearing 4 or 5 spreading *leaves* near the bottom, and 1 or 2 small, sheathing, upright ones towards the middle. *Spike* long, cylindrical, of numerous, rather crowded, scentless *flowers*, whose green hue, tinged more or less with brown, renders them not very conspicuous. The *lip* however is usually of a pale yellow, without any spots, though occasionally tipped with brown, or dark red. Ray noticed such a variety near Geneva, and in his *Synopsis* speaks of it as but a variety. I gathered one at Valcimara among the Apennines, with the *lip* entirely red; see *Tour on the Cont. ed. 2. v. 2. 325*, which is marked with no character of a distinct species.

Willdenow has, after Link, published an *Ophrys anthropomorpha*, *Sp. Pl. v. 4. 63*, distinguished by the *lip* being only half the length of the *germen*. Hence a specific character for our *Aceras* is become necessary.

413. HERMINIUM. Musk-orchis.

Linn. Gen. Pl. ed. 1. 271. Brown in Ait. H. Kew. ed. 2. v. 5. 191.

Comp. ed. 3. 128. ed. 4. 141.

Monorchis. Mich. Gen. 30. t. 26.

Cal. superior, of 3 ovate, concave, equal, spreading, permanent leaves. *Pet.* 2, fleshy, ovate, flat, spreading, more or less deeply three-lobed, acute, nearly as long as the calyx. *Nect.* a *lip* without a *spur*, deeply three-lobed, spreading like the petals, but rather longer, slightly tumid at the base underneath. *Anth.* roundish, of 2 cells close together, over the *stigma*, depositing the globular, stalked, granulated masses of *pollen*, by their stalks, upon 2 separate naked glands. *Germen* elliptic-oblong, twisted, furrowed. *Style* short and thick. *Stigma* a moist cavity in front. *Caps.* ovate-oblong, triangular, nearly straight. *Seeds* very numerous.

Root of two globular *knobs*, rather woolly; one of them stalked, distant, later than the other. *Stem* solitary, 3 or 4 inches high, leafy below. *Leaves* elliptic-lanceolate, sheathed at the base. *Fl.* spiked, numerous, small, greenish-yellow.

This genus, happily restored by Mr. Brown, is clearly and essentially marked by the *petals* and *lip* nearly resembling each other, and being all three-lobed. *Malaxis* of Swartz has long been separated from the original *Herminium*, with which it has little affinity, though both were referred to *Ophrys* by Linnæus in his later publications.

1. *H. monorchis*. Green Musk-orchis.

Radical leaves two, lanceolate. *Br.*

H. monorchis. *Br. as above*, 191. *Comp. ed.* 4. 143. *Hook. Lond.* t. 138.

Ophrys monorchis. *Linn. Sp. Pl.* 1342. *Willd. v.* 4. 61. *Fl. Br.* 936. *Engl. Bot. v.* 1. t. 71. *Dicks. H. Sicc. fasc.* 10. 18. *Fl. Dan.* t. 102. *Ehrh. Phytoph.* 27.

Orchis n. 15. *Gmel. Sib. v.* 1. 18. t. 4. f. 1.

O. n. 1262. *Hall. Hist. v.* 2. 132. t. 22. f. 2.

O. odorata moschata, sive *Monorchis*. *Bauh. Pin.* 84. *Raii Syn.* 378. *Rudb. Elys. v.* 2. 207. f. 1. *Rupp. Jen. ed.* 1. 282. f.

O. parva autumnalis lutea. *Bauh. Hist. v.* 2. 768. f.

O. coleo unico, seu *Monorchis flosculis pallidè viridibus*. *Læs. Pruss.* 184. t. 61.

O. trifolia, floribus spicatis herbaceis. *Segu. Veron. v.* 2. 131. t. 16. f. 15.

Monorchis montana minima flore obsoleto vix conspicuo. *Mich. Gen.* 30. t. 26. f. E, F. *Segu. Veron. suppl.* 251. t. 8. f. 8.

M. bifolia, floribus viridibus, moschu molentibus. *Men tz. Pugill.* t. 5. f. 3.

M. foliis angustis, fl. luteis ceram olentibus. *Ibid.* f. 4.

Serapias et Triorchis Æginetæ. *Lob. Ic.* 187. f.

Testiculus odoratus. *Ger. Em.* 218. f.

Triorchis lutea Gemmæ. *Dalech. Hist.* 1561. f.

On chalky banks and hillocks, but not very common.

In the great chalk-pit at Marham, Norfolk, 1779. Found also in Berkshire, Cambridgeshire, Suffolk, Essex, Kent and Surrey, but not in the north.

Perennial. *June, July.*

Root of several thick woolly fibres, and one globular hairy knob, the size of a large pea, which is the source of the plant of the present year. One of these apparent fibres, rarely more, bears at its extremity a small young knob, destined to enlarge afterwards, and to flower in the following summer. *Herb* smooth, of a light bright green. *Stem* 4 or 5 inches high. *Leaves* two, rarely three, sheathing, alternate, at, or near, the bottom of the stem, elliptic-lanceolate, acute, obscurely ribbed, concave; the third, if present, often elevated towards the middle of the stem; and there is occasionally a small, membranous, lanceolate, taper-pointed bractea higher up, similar to those under each flower. *Spike* dense, $1\frac{1}{2}$ or 2 inches long. *Fl.* small, numerous, smelling like musk and honey, especially in an evening. *Cal.* green, leafy, concave, spreading equally in three directions. *Pet.* of a totally different substance, thick, yellowish, longer than the calyx, spreading between its leaves; ovate at the base, with a more or less prominent angle, or lobe, at each side, and suddenly tapering into an elongated point. *Lip* of the exact

substance and hue of the petals, but more deeply lobed at each side, spreading equally with them, and about the same length, pale and somewhat tumid at its base. *Column* short and thick. *Anth.* in front, roundish, pale brown, as is likewise the *pollen*, the *glands* that receive it being, as Mr. Brown observes, naked and separate, which is doubtless a confirmation of the genus, though I prefer an obvious character founded on the very peculiar *petals* and *nectary*; which so strongly resemble each other, and so widely differ from the *calyx*; just like those of *Stelis*, see *Exot. Bot. t. 75*, the structure of which irrefragably confirms the above views of *Herminium*.

I have adopted the specific character of Mr. Brown, presuming that he has formed it from an acquaintance with some more species, of which perhaps traces may be found in Lobel, Gerarde, Mentzelius, and others, though no systematic botanist hitherto has verified their figures, one of which has hairy leaves !

414. OPHRYS. Insect-orchis.

Linn. Gen. 462. *Juss.* 65. *Fl. Br.* 931. *Br. in Ait. H. Kew. ed. 2.* v. 5. 195. *Lam. t.* 727. *f.* 1, 3. *Sw. Orch.* 43. *t.* 1. *f.* D. *Orchis. Tourn. t.* 247. C, D.

Cal. superior, of 3, ovate-oblong, ribbed, equal, spreading, permanent, sometimes coloured, leaves. *Pct.* 2, linear-oblong, smaller than the calyx, sometimes downy, spreading, undivided. *Nect.* a *lip* without a spur, longer than the calyx, spreading downwards; partly downy or shaggy; convex above, with a smooth disk; concave and even beneath; variously lobed at the margin. *Anth.* oblong, of two parallel cells, more or less close together over the *stigma*, depositing the obovate, stalked, granulated, elastic masses of *pollen*, by their stalks, upon two glands, "contained in two separate hoods." *Ferd. Bauer.* *Germ.* oblong, curved, furrowed. *Style* short and thick, channelled in front. *Stigma* a moist cavity beneath the anther. *Caps.* oblong, obtuse, angular, with prominent ribs. *Seeds* very numerous and minute, tunicated.

Root of two successive ovate, or globose, stalked *knobs*, generally somewhat downy, as well as the *radicles*. *Herb* smooth. *Stem* solitary, round, chiefly leafy at the base. *Leaves* several, ovate, or partly lanceolate, the upper ones narrowest. *Spike* lax. *Bractees* lanceolate, concave, large, erect, about as long as the *flowers*, which are large and handsome, inodorous, variously coloured, especially the *lip*, resembling various kinds of insects. The species are chiefly distinguished by their *flowers*;

yet Linnæus cannot be excused for considering them as mere varieties.

1. *O. muscifera*. Fly Orchis.

Lip twice as long as the calyx, with four expanded lobes, somewhat downy; the disk polished. Petals linear. Column obtuse.

O. muscifera. *Huds. ed. 1.* 340. *ed. 2.* 391. *Fl. Br.* 937. *Comp. ed.* 4. 143. *Engl. Bot. v. 1. t.* 64. *Br. in Ait. H. Kew. ed. 2. v. 5.* 196. *Hook. Lond. t.* 31. *Dicks. H. Sicc. fasc.* 15. 15. *Davies Welsh Botanol.* 83.

O. inscctifera α , *myodes*. *Linn. Sp. Pl.* 1343. *Gunn. Norveg. p.* 2. 121. *t. 5. f.* 1, 2.

O. myodes. *Sw. Orch.* 45. *Willd. Sp. Pl. v. 4.* 64. *Jacq. Misc. v. 2.* 373. *Ik. Rar. t.* 184. *Fl. Dan. t.* 1398. *Andr. Repos. t.* 471. *Forst. Tonbr.* 100.

Cypripedium. *Linn. It. Oeland.* 44.

Orchis muscaria. *Scop. Carn. v. 2.* 193.

O. n. 1265. *Hall. Hist. v. 2.* 133. *t. 24. f.* 2.

O. myodes. *Ger. Em.* 313. *f.*

O. myodes, *galeâ et alis herbidis*. *Bauh. Hist. v. 2.* 767. *f. Raii Syn.* 379.

O. myodes prima, *floribus muscam exprimens*. *Lob. Ic.* 181. *f.*

O. muscæ corpus referens minor, *vel galeâ et alis herbidis*. *Bauh. Pin.* 83. *Rudb. Elys. v. 2.* 201. *f. 11. Vaill. Par.* 147. *t. 31. f.* 17, 18.

O. serapias tertius. *Dod. Pempt.* 238. *f. Dalech. Hist.* 1555. *f.*

Vulpinus testiculus. *Lob. Obs.* 91. *f. 1 only.*

β . *Orchis myodes major*. *Raii Syn.* 379.

O. muscam referens major. *Bauh. Pin.* 83? *Rudb. Elys. v. 2.* 201. *f. 10?*

In chalky pastures, or in meadows among calcareous rocks sparingly, or much dispersed.

In Cambridgeshire, Essex, and Suffolk. *Ray.* Kent plentifully. *Huds.* About Roche Abbey, Yorkshire. *Mr. Salt.* About Matlock bath, Derbyshire; also near Bristol; and in several parts of Berkshire, as well as Norfolk.

Perennial. *June.*

This is one of the most distinct species. Its habit is more slender than the rest, and the leaves narrower, a little glaucous. Stem somewhat leafy, usually about a foot high. Fl. about six, more or less, rather distant, sessile, each with a lanceolate sheathing bractea, longer than the germen. They strikingly resemble some sort of fly, yet not any one in particular. Cal. widely spreading, green, broadly ovate, smooth. Pet. ascending, linear, very narrow, chocolate-coloured, downy, as long as the calyx. Lip twice that length, dependent; its disk convex, smooth, marked with a pale blueish, shining, partly cloven, spot in the middle;

otherwise of the colour of the petals, having four broadish, nearly equal, widely spreading, or deflexed, more or less downy, entire, marginal lobes, each about as long as the disk. The under side is concave, green, very smooth, without any traces of a spur or keel. There are two shining prominent spots at the base of the lip above. The *column* is obtuse, not extending beyond the obovate *anther*. Mr. Ferdinand Bauer, the ingenious draughtsman of the *Flora Græca*, is recorded by Mr. Brown as having first observed the glands which receive the *pollen* to be contained in two distinct hoods. This confirms the more obvious generic character founded on the convex or tumid *lip*.

The larger variety, β , appears by Buddle's herbarium to differ very slightly from the common sort; though the figures of old authors quoted for it are probably different, as the small intermediate point of their lip indicates.

2. *O. apifera*. Bee Orchis.

Lip the length of the calyx, tumid, with five reflexed marginal lobes; the terminal one awlshaped; the rest hairy above. Calyx coloured. Column with a hooked point.

O. apifera. *Huds. ed. 1.* 340. *ed. 2.* 391. *Fl. Br.* 938. *Engl. Bot. v. 6. t.* 383. *Willd. Sp. Pl. v. 4.* 66. *Br. in Ait. H. Kew. ed. 2. v. 5.* 195. *Curt. Lond. fasc. 1. t.* 66. *Shaw Nat. Misc. t.* 23. *Dicks. H. Sicc. fasc. 18.* 22.

O. insectifera ι . *Linn. Sp. Pl.* 1343.

Orchis fuciflora, galeâ at alis purpurascens. *Raii Syn.* 391. *Bauh. Hist. v. 2.* 766, *description*; and *O. sive Testiculus sphægodes hirsuto flore*, 767. *f.*

O. fucum referens major, foliis superioribus candidis et purpurascens. *Bauh. Pin.* 83. *Rudb. Elys. v. 2.* 199. *f. 7.* *Vaill. Par.* 146. *t. 30. f. 9.*

O. araneam referens, rostro recurvo. *Segu. Veron. suppl.* 246. *t. 8. f. 2.*

O. sexta. *Trag. Hist.* 783. *f.*

O. minor, violaceis floribus. *Cord. Hist.* 129. *f.*

Triorchis fœmina. *Fuchs. Hist.* 560. *f.*

Satyrium quartum. *Brunf. Herb. v. 1.* 105. *f.*

S. minus. *Sweert Floril. t.* 63. *f. 5.*

Testiculus vulpinus secundus sphægodes. *Lob. Ic.* 179. *f. Ger. Em. 212. f.*

In meadows and pastures, in chalky or limestone countries, not very uncommon.

Perennial. *July*.

Herb taller, stouter, and often less glaucous, than the foregoing. *Bractæas* larger and broader, as well as the *foliage*. *Fl.* also larger, and very conspicuous, compared to bees, chiefly from the form and hairiness of the *nectary*. *Calyx-leaves* widely spreading, ovate, concave, of a pink or rose-colour, often partly

white, with a green keel. *Pet.* much smaller, oblong, bluntish, convex, spreading, greenish, hairy on the inner surface. *Lip* large, prominent, tumid, or inflated, scarcely longer than the *calyx*; its disk smooth and polished, dark brown, variously marked with yellowish, angular or curved, lines and spots; the margin in five shallow reflexed lobes, of which the two uppermost are prominent, and very hairy, above, like the thighs of a bee; the two next dilated, thin and rounded; the terminal one elongated, awl-shaped, acute, somewhat recurved at the point. *Column* green, vaulted, with a sharp incurved point above the *anther*, whose two linear cells are considerably distant from each other, above the *stigma*. Masses of *pollen* yellow, with long taper stalks. *Caps.* large, with thick prominent ribs.

3. *O. arachnites*. Late Spider Orchis.

Lip longer than the *calyx*, dilated, somewhat tumid, with five shallow, inflexed, marginal lobes; the terminal one flattened. *Calyx* coloured. *Column* with a hooked point. *Petals* deltoid, downy.

O. arachnites. Willd. *Sp. Pl.* v. 4. 67. *Curt. Mag.* t. 2516. *Roth. Germ.* v. 2. p. 2. 405. *Hoffm. Germ.* 318. *Host. Syn.* 492.

O. insectifera η . *Linn. Sp. Pl.* 1343.

Orchis arachnites. *Scop. Carn.* v. 2. 194.

O. n. 1266. *Hall. Hist.* v. 2. 134. t. 24. f. 1, *fuciflora*. f. 1—3.

O. araneam referens. *Vaill. Par.* t. 30. f. 10—13. *Segu. Veron. suppl.* 244. t. 8. f. 1. *But not of Bauhin.*

O. melittias. *Ger. Em.* 213. f. ?

O. serapias secunda Dodonæi. *Besl. Hort. Eyst. æstiv. ord.* 4. t. 6. f. 1; good.

O. fucum referens major, foliolis superioribus candidis et purpurascens. *Rudb. Elys.* v. 2. 199. f. 7; rather than *Ophrys apifera*.

Satyrium quartum. *Brunf. Herb.* v. 1. 105. f. ?

In chalky pastures.

Plentiful on the southern acclivities of the chalky downs near Folkstone, Kent. The conical hill which forms the north-west boundary of the Cherry-garden, near that town, abounding in its upper half with this species, and in the lower with *O. apifera*.
Mr. Gerard E. Smith.

Perennial. *July.*

Roots and herbage, in general, like *O. apifera*, but the *leaves* are, according to Mr. Smith, usually narrower. In Swiss specimens I find no difference. The essential distinctions exist in the *flowers*, and these are sufficiently well represented by Haller, Seguiet, and Vaillant, though Haller considers the two plants as varieties only, fig. 4 and 5 of his *fuciflora* being our *apifera*. The *calyx-leaves* are shorter in proportion to the *lip* than those of the *apifera*, always paler, and rather white than pink, except when the *flowers* approach to decay; the keel green, as in that

species. *Pet.* rather smaller, shorter, and broader, more coloured; downy on the inner surface. *Lip* essentially and obviously different, much broader and more dilated, nearly twice as long as the calyx; its margin thin, expanded, and directed forward, not reflexed; the terminal lobe likewise thin and flat, pointing forward, more or less heart-shaped and notched, not awl-shaped and reflexed. The disk moreover is of a duller brown, the lines and spots less yellow, or vivid. There are variations as to the *lip* being more oblong, or more or less deeply lobed, but the terminal segment is constant; nor can there be any doubt of the present species being perfectly distinct. I have often gathered and examined it in the grass-plats about Rome, but never till now met with British specimens. Mr. G. E. Smith's discovery is the more satisfactory, as he clearly determined its specific differences, without suspecting it to be a described plant. This cannot, as he well remarks, be a mule of the *apifera* and our *aranifera*, there being a distance of two months between their periods of flowering. The latter should now be named Early Spider Orchis.

The *O. arachnites* is observed to grow more in tufts, or clumps, than the *apifera*, which is commonly scattered, or solitary, though less so than *O. muscifera*.

4. *O. aranifera*. Early Spider Orchis.

Lip the length of the calyx, tumid, hairy, rounded, with four shallow, reflexed, marginal lobes. Column acute, incurved. Cells of the anther near together. Petals linear, smooth.

O. aranifera. *Huds.* 392. *Fl. Br.* 939. *Engl. Bot.* v. 1. t. 65. *Willd. Sp. Pl.* v. 4. 66.

O. fucifera. *Curt. Lond. fasc.* 6. t. 67.

Orchis sive Testiculus sphægodes, hirsuto flore. *Raii Syn.* 380. *Bauh. Hist.* v. 2. 767, *descr. not fig.*

O. fucum referens, colore rubiginoso. *Bauh. Pin.* 83. *Rudb. Elys.* v. 2. 200. f. 9, bad, copied from *Lobel's* and *Gerarde's* figure of the last. *Vaill. Par.* 146. t. 31. f. 15, 16, excellent.

O. andrachnitis. *Lob. Ic.* 185. f. *Ger. Em.* 216. f.

O. serapias secundus minor. *Dod. Pempt.* 238.

O. araneam referens. *Bauh. Pin.* 84. *Rudb. Elys.* v. 2. 203. f. 17, bad, copied from *Lobel.* *Tourn. Inst.* 434. t. 247. f. C, C.

Testiculus vulpinus secundus. *Lob. Obs.* 88. f.

In dry chalky, limestone, or gravelly pastures and pits.

In Cambridgeshire. *Ray.* Yorkshire, near Tadcaster. *Richardson.* Kent. *Dillenius.* Near Bury. *Sir T. G. Cullum.* In stone quarries, Oxfordshire. *Sibthorp.*

Perennial. *April.*

Of more humble growth than the last, with fewer flowers; the herbage rather more glaucous. *Cal.* bluntish, uniformly green.

Pet. also green, but smooth, and rather paler. *Lip* rounded like the last, but less inflated, and entirely destitute of a fifth or terminal lobe; its whole surface of nearly a uniform dark brown, and hairy, except two parallel, livid, shining, smooth, uneven lines, connected by a cross bar, on the disk: the margin pale, smoothish, in four very shallow, reflexed, rounded lobes. *Column* inflexed, acute, but not much elongated beyond the *anther*, whose cells are near together.

5. *O. fucifera*. Drone Orchis.

Lip longer than the calyx, obovate, hairy, undivided, with a spreading wavy margin. *Column* bluntly pointed, incurved. *Petals* roughish; ovate at the base.

Orchis fucum referens, Burser. *Rudb. Elys. v. 2.* 205. *f.* 25; petals too narrow.

On chalky hillocks and banks.

In Kent. *Mr. E. Barnard, and Mr. T. F. Forster.*

Perennial. *May, June.*

Of the size and habit of the last, with which the general aspect of the *flowers* accords, though they are of a somewhat lighter brown, and seldom more than three in each spike. I have had no opportunity of comparing this plant with the *O. aranifera* in a fresh state, as it blossoms 6 weeks or 2 months later, but from an examination of the *flowers*, recent as well as dried, the following differences are observable. The *petals* are minutely downy, or rough, on their inner surface, and are remarkably dilated, or ovate, in their lower half, terminating with an oblong blunt point. The *lip* is rather longer than the *calyx*, obovate, convex, but not tumid or inflated; the disk brown, smooth; the sides very hairy; but the margin itself smooth, thin, pale, expanded, not inflexed, wavy, not lobed, nor is there any terminal point or appendage. The *column* ends in a short, thick, inflexed beak. Each cell of the *anther* has a dilated, pale, membranous border, though scarcely more considerable than in *O. aranifera*.

Rudbeck's figure, taken from a specimen in Burser's herbarium at Upsal, is among those which he has added, as new species, to what C. Bauhin enumerates. This figure is very characteristic, except the *petals* being too narrow throughout. I can find no traces of this *Ophrys* in any other writer. *O. arachnites* of Scopoli, Willdenow, &c, Haller's *Orchis n.* 1266, not hitherto observed in Britain, though common on the continent, is distinguished by an inflexed, flattish, smooth appendage to the very broad *lip*; its *petals*, all over hairy in front, are smooth at the back, and are contracted gradually from the broad base upward; the *calyx* is green. *O. arachnoides*, *Andr. Repos. t.* 470, my supposed variety of *O. apifera*, *Tour on the Continent, ed. 2.* v. 2. 325, if not a species, is rather perhaps a variety of *arachnites*, with coloured *petals* and *calyx*. Yet the former are downy

34 GYNANDRIA—MONANDRIA. Goodyera.

on both sides, and there is a very peculiar deep central depression on the *lip*. Haller may have overlooked our three latter species, as varieties of his *n.* 1266, for they are probably natives of Switzerland. Vaillant, as far as he goes, is the most correct in his figures of *Orchideæ*, as well as in their synonyms.

*** Anther parallel to the stigma, permanent.*

415. GOODYERA. Goodyera.

Br. in Ait. H. Kew. ed. 2. v. 5. 197.

Cal. superior, of 3 ovate, concave, spreading, permanent, coloured leaves, equal in length; the 2 lateral ones somewhat dilated at the outer margin, and meeting under the nectary. *Pet.* 2, half-ovate, erect, converging under the upper calyx-leaf, and about the same length. *Nect.* without a spur, as long as the petals, prominent, inflated and obovate beneath, lying on the 2 lateral calyx-leaves, and terminating above in an oblong, acute, undivided point, shorter than the inflated part on which it lies. *Anth.* roundish, parallel to the stigma, and fixed to its upper part behind, of 2 parallel cells close together, depositing the obovate, granulated masses of *pollen* upon the summit of the stigma. *Germ.* obovate, angular, incurved. *Style* short and thick. *Stigma* prominent, in front, somewhat angular, pointed. *Caps.* nearly elliptical, angular, furrowed. *Seeds* very minute.

Creeping *herbs*, with long woolly *roots*. *Stems* solitary, simple, a span high or more; leafy at the bottom; bearing several awl-shaped scattered *bracteas* above; and each terminating in a unilateral *spike*, either spiral or straight, of small, whitish fragrant *flowers*.

1. *G. repens*. Creeping Goodyera.

Leaves ovate. Spike spiral. Point of the nectary elongated, deflexed.

G. repens. *Br. as above*, 198. *Hook. Scot.* 253. *Lond. t.* 144.

Neottia repens. *Swartz Orchid.* 52. *Willd. Sp. Pl. v.* 4. 75. *Comp. ed.* 4. 144.

Satyrion repens. *Linn. Sp. Pl.* 1339. *Fl. Br.* 930. *Engl. Bot. v.* 5. *t.* 289. *Lightf.* 520. *t.* 22. *Dicks. Dr. Pl.* 85. *Jacq. Austr. t.* 369. *Fl. Dan. t.* 812. *Gunn. Norveg. part.* 2. 3. *t.* 6. *f.* 1.

Epipactis n. 1295. *Hall. Hist. v.* 2. 153. *t.* 22. *f.* 4. *Segu. Veron. suppl.* 253. *t.* 8. *f.* 10.

Orchis radice repente. *Camer. Ic. t.* 35; good. *Bauh. Hist. v.* 2. 770. *f.* 3, not 1 and 2.

O. repens. *Besl. Hort. Eyst. æstiv. ord.* 4. *t.* 5. *f.* 6.

Pseudo-orchis. *Bauh. Pin.* 84. *Rudb. Elys. v.* 2. 209. *f.* 8.

Palma Christi, radice repente. *Ger. Em.* 227. *f.*

Pyrola acutifolia polyanthos, radice geniculatâ. *Læs. Pruss.* 210. *t.* 68.

In mossy alpine woods in Scotland, but rare.

In an old birch wood called *Ca bue*, or Yellow hill, about 2 miles from the head of little Loeh Broom, Ross-shire. *Lightfoot*. Opposite Moy hall, near Inverness. *Dr. Hope*. About Brodie house, Moray. *J. Brodie, Esq.* Found by Mr. Murray in the woods of Culloden, near Inverness, and about Gordon castle and Scone. *Hooker*.

Perennial. *July*.

Root branched, knotty, or jointed, with downy radicles, ereeping extensively among moss and rotten leaves; each shoot terminating in a solitary tuft of 6 or 8 broad-stalked, ovate, bluntish, smooth leaves, an inch long, somewhat speckled with brown, marked with 5 ribs, connected by transverse veins. *Flowering stems* solitary, from the centres of some of these tufts, hardly a span high, round, smooth, bearing several scattered, erect, linear-lanceolate, acute, smooth bracteas. *Spike* spiral, downy, with a downy tapering bractea to each flower, rising rather above the downy germen. *Fl.* small, spirally unilateral, about 10 to 15 in each spike, sweet-scented. *Cal.* externally downy, white like the petals. *Nect.* white in the tumid part, with tawny stripes; the point white or pale red, lanceolate, keeled, projecting nearly as far as the inflated base. *Caps.* light brown, smooth.

The tumid base of the nectary, being placed above, not behind, the calyx, is not a spur, but a part of the lip, and justifies the opinion of *Lightfoot*, that *Linnaeus* ought rather to have referred this plant to his genus *Serapias*.

G. pubescens of Mr. Brown, a North American species, is twice as tall, with larger, more strongly speckled leaves, 30 or 40 flowers in a straight, not spiral, spike, and a very short, ascending point to the nectary. But our *G. repens* grows also in the colder parts of North America, and may have been mistaken for the true *pubescens*, though obviously distinct.

It is with great pleasure that I now adopt this genus of my learned friend, from whom I always hesitate to differ in opinion; especially as the name he has chosen records one of the most deserving of our early English botanists, Mr. John Goodyer of Hampshire, commemorated by Johnson in his preface to the second edition of *Gerarde's Herbal*, and whose very accurate and intelligent communications enrich many parts of that work; see particularly the chapter on Elms.

416. NEOTTIA. Ladies' Traces.

Jacq. Col. v. 3. 173. *Swartz Orch.* 49. *Willd. v.* 4. 72. *Br. in Ait. H. Kew. ed. 2. v.* 5. 198. *Prodr.* 319.

Cal. superior, of 3 concave, ovate or lanceolate, converging, permanent, coloured leaves, equal in length; the 2 lateral ones meeting under the nectary. *Pet.* 2, oblong, erect, converging under the upper calyx-leaf, and about the same length. *Nect.* without a spur, as long as the calyx, prominent, oblong, bluntish; keeled underneath, especially at the base, within the calyx. *Anth.* roundish, parallel to the stigma, of 2 cells close together, depositing the obovate masses of pollen upon the stigma. *Germ.* obovate, with 3 furrows. *Style* short, thick, cylindrical, not winged. *Stigma* prominent, in front, globose, with 2 points. *Caps.* obovate, obtuse, with 3 furrows and 3 blunt angles. *Seeds* very minute.

Root of several oblong vertical knobs. *Leaves* several, radical, ovate or lanceolate. *Stalk* sheathed with bracteas. *Spike* many-flowered, generally unilateral and spiral.

1. *N. spiralis*. Sweet Ladies' Traces.

Leaves ovate, stalked. Spike twisted, unilateral. Bracteas downy, tumid. Lip ovate, entire.

N. spiralis. *Sw. Orch.* 51, excluding the variety. *Willd. Sp. Pl.* v. 4. 73. *Br.* as above, 199. *Comp. ed.* 4. 144. *Forst. Tonbr.* 101.

Ophrys spiralis. *Linn. Sp. Pl.* 1340. *Fl. Br.* 934. *Engl. Bot.* v. 8. t. 541. *Curt. Lond. fasc.* 4. t. 59. *Dicks. H. Sicc. fasc.* 10. 17. *Ehrh. Phyt.* 66. *Fl. Dan. t.* 387. *Davies Welsh Botanol.* 83.

Orchis spiralis alba odorata. *Raii Syn.* 378. *Bauh. Hist.* v. 2. 769, descr. only. *Vaill. Par.* 147. t. 30. f. 17, 18.

Triorchis. *Ger. Em.* 218. f.

T. alba odorata minor; also major. *Bauh. Pin.* 84. *Rudb. Elys.* v. 2. 209. f. 7.

Testiculus odoratus. *Dalech. Hist.* 1555. f.

T. odoratus major et minor. *Dod. Pempt.* 239. f, f.

T. odoratus; also *Tetrorchis*, vel *Triorchis*, *alba spiralis*, vel autumnalis. *Lob. Ic.* 186. f, f. *Obs.* 89. f, f.

Satyrium odoriferum. *Brunf. Herb.* v. 1. 105. f.

In open pastures, on a chalky or gravelly soil, or in meadows, in various parts of England; not in Scotland.

Perennial. *August, September.*

Knobs of the root 2, 3, or more, ovate-oblong, brown, downy, nearly perpendicular, successive, apparently besprinkled with small capillary radicles, which if so are very remarkable. *Leaves* several, all radical, on broad stalks, spreading, ovate, acute, ribbed, rather glaucous. *Stalk* radical, a finger's length or more, viscid and downy upwards, clothed with several sheathing, upright, pointed bracteas. *Spike* spiral, of many, crowded, small, white, highly fragrant flowers, in a single row, each with an ovate, tumid, pointed, downy, close bractea.

Haller doubtless comprehends this under his *Epipactis* n. 1294, though his *t.* 38 represents a very distinct species, with long upright *leaves*, and more slender *roots*, the *flowers* larger, and less crowded, with a dilated *lip*. This blossoms earlier, and is well distinguished by Vaillant, as well as by Mr. J. Lindley in his *Collectanea Botanica*. We have no account of it as a british plant. It is Micheli's *Orchiastrum*, *t.* 26. *f.* D : and Seguier has the same, with confused synonyms, in his *Suppl.* 252. *t.* 8. *f.* 9.

2. *N. gemmipara*. Proliferous Ladies' Traces.

Leaves lanceolate, as tall as the stalk. Spike three-ranked, twisted. Bractees smooth.

In marshes on the west coast of Ireland.

Near Castletown, opposite to Bearhaven on the northern side of Bantry bay, County of Cork, in small quantities. Mr. Drummond.

Perennial. July.

Root of 2 thick, fleshy, downy, annual, perpendicular *knobs*, each about three inches long, and one fifth of an inch in diameter near its origin, tapering downwards to a blunt point. *Leaves* five or six, upright, broadly lanceolate, acute, three-ribbed, three inches in length. *Footstalks* broad, sheathing, near an inch long. *Stalk* erect, two inches high, sheathed more than half way up by the footstalks of the innermost leaves, and bearing in the upper part 2 or 3 lanceolate, smooth, upright *bractees*. *Spike* an inch long, ovate, dense, erect, of about 18 white *flowers* in three rows, twisted round in a very remarkable way, and each accompanied by a smooth lanceolate *bractea*, as tall as itself. The *flowers* much resemble those of *N. spiralis*, and the *lip* is fringed; but the *calyx* and *petals* are twice as long as in that species, and the *calyx* is more taper-pointed. The outside of the *flowers*, and the *capsule*, are downy: every other part of the herb is smooth. *Buds*, destined to flower the following year, are formed among the leaves, at the bottom of the flower-stalk. After flowering the *root* decays, and the following spring each bud puts forth a pair of oblong *knobs*, as above described, and becomes a separate plant.

Such is the account given by the accurate Mr. Drummond, and communicated to me in August 1810, along with a specimen, by the Rev. Mr. Hincks of Cork. Several living plants were sent to the Cork garden, but their roots were destroyed by rats. I have waited from year to year for specimens in a fresh state; but hitherto in vain. The above characters will sufficiently identify the species when found, and it is a most interesting addition to our *Flora*.

417. LISTERA. *Listera*, or Twayblade.

Br. in *Ait. H. Kew. ed.* 2. v. 5. 201. *Comp. ed.* 4. 141.

Ophris. *Tourn. t.* 250.

Nidus avis. *Ibid.*

Cal. superior, of 3 ovate, concave, spreading, permanent, equal leaves. *Pet.* 2, lanceolate, spreading, nearly as long. *Nect.* without a spur, much longer than the petals, dependent, two- or four-lobed; slightly concave at the base within the calyx; disk marked with a longitudinal central furrow, producing honey. *Anth.* oblong, parallel to the stigma, to which it is fixed behind by its base, of 2 close, parallel, linear cells, which deposit the powdery masses of pollen upon the upper lip of the stigma. *Germ.* obovate, or roundish, angular. *Style* very short, cylindrical, not bordered. *Stigma* in front, of 2 unequal, flat, parallel lips; the lowermost rounded, very short. *Caps.* elliptic-oblong, obtuse, angular, ribbed. *Seeds* minute, tunicated.

Root of numerous clustered fibres. *Leaves* two, about the middle of the *stem*; sometimes wanting. *Fl.* pale or greenish, scentless, in a long upright *cluster*, with a small *bractea* under each partial stalk.

The name commemorates Dr. Martin Lister, contemporary with Ray, best known as a conchologist and entomologist.

1. *L. ovata*. Common Twayblade.

Leaves elliptical, opposite. Nectary with two linear-oblong, nearly parallel, lobes. Column with a posterior hood.

L. ovata. *Br. as above*, 201. *Comp. ed.* 4. 144. *Forst. Tonbr.* 100. *Hook. Scot.* 253.

Ophrys ovata, *Linn. Sp. Pl.* 1340. *Fl. Br.* 932. *Engl. Bot. v.* 22. *t.* 1548. *Curt. Lond. fasc.* 3. *t.* 60. *Fl. Dan. t.* 137.

Ophris. *Fuchs. Hist.* 566. *f.* *Ic.* 325. *f.* *Matth. Valgr. v.* 2. 565. *f.* *Camer. Epit.* 943. *f.* *Dalech. Hist.* 1261. *f.*

O. bifolia. *Bauh. Pin.* 87. *Ger. Em.* 402. *f.* *Rudb. Elys. v.* 2. 226. *f.* 1; also *trifolia f.* 2. *Segu. Veron. v.* 2. 138.

Epipactis n. 1291. *Hall. Hist. v.* 2. 150. *t.* 37.

E. ovata. *Sw. Orch.* 66. *Willd. Sp. Pl. v.* 4. 87.

Bifolium. *Lob. Ic.* 302. *f.*

B. majus, seu *Ophris major quibusdam.* *Raii Syn.* 385. *Bauh. Hist. v.* 3. *p.* 2. 533. *f.*

Pseudo-orchis, Bifolium. *Dod. Pempt.* 242. *f.*

Perfoliata mascula et foemina. *Brunf. Herb.* 182, 183. *f. f.*

In groves and thickets, meadows and pastures.

Perennial. *June.*

Root of numerous, long, slender, cylindrical, smooth radicles, con-

nected, in small bundles, by one common fibre. *Stems* solitary, from 1 to 2 feet high, straight, bearing about the middle 2, rarely 3, sessile, elliptical, smooth, spreading *leaves*, each with 3, 5, or more ribs. The *stem* above their insertion is more slender, and downy, terminating in a long *cluster* of very numerous green *flowers*. *Bractes* ovate, pointed, smooth, shorter than the partial stalks. *Cal.* somewhat tinged with brown. *Pet.* and *lip* light green; the latter without any lobes at the base; its disk marked with a honey-bearing furrow, evidently justifying the name of *nectary* for this part. The *column* terminates in a concave, obovate, hood-like appendage, which seems peculiar to this species. Each mass of *pollen* is cloven, or double. *Caps.* roundish-obovate. *Seeds* each with a pale taper *tunic*, greatly lengthened out at the ends.

In *Engl. Bot.* the upper lip of the *stigma* is, by mistake, called the lower lip of the *column*.

2. *L. cordata*. Heart-leaved Mountain Twayblade.

Leaves heart-shaped, opposite. Nectary with four lobes.

L. cordata. *Br.* as above, 201. *Comp. ed.* 4. 144. *Hook. Scot.* 253. *Lond. t.* 143.

Ophrys cordata. *Linn. Sp. Pl.* 1340. *Fl. Br.* 933. *Engl. Bot.* v. 5. t. 358. *Dicks. H. Sic. fasc.* 2. 19. *Ehrh. Phytoph.* 76. *Gunn. Norveg. part* 2. 76. t. 3. f. 6—8. *Fl. Dan. t.* 1278.

Ophris minima. *Bauh. Pin.* 87. *Prodr.* 31. *Rudb. Elys. v.* 2. 227. f. 4. *Gagnebin in Act. Helvet. v.* 2. 56. t. 6.

Epipactis n. 1292. *Hall. Hist. v.* 2. 151. t. 22. f. 3.

E. cordata. *Sw. Orch.* 66. *Willd. Sp. Pl. v.* 4. 88.

Bifolium minimum. *Raii Syn.* 385. *Bauh. Hist. v.* 3. p. 2. 534. f.

On turfy mountainous moors in the north.

In several parts of Derbyshire, Yorkshire, Northumberland and Lancashire. *Ray*. In many parts of the Highlands of Scotland. *Lightfoot*. Also in several places in the Lowlands. *Hooker*. On Ingleborough hill, and on moors between Sheffield and Chatsworth.

Perennial. *July*.

Like the preceding in habit, but scarcely one third so large. *Fibres* of the *root* more simply tufted. *Leaves* heart-shaped, acute, with much finer ribs. *Stem* angular. *Cluster* smooth, of scarcely more than ten little green *flowers*, often partly tinged with brown. *Lip* with a pair of spreading linear lobes at the base, smaller than the terminal ones. *Column* destitute of any hood-like appendage behind the *anther*. *Capsule* globular.

3. *L. Nidus avis*. Bird's nest *Listera*.

Leaves none. Stem clothed with sheathing scales. Nectary with two spreading lobes.

L. Nidus avis. *Hook. Scot.* 253. *Lond. t.* 58.

Epipactis Nidus avis. *Sw. Orch.* 66. *Willd. Sp. Pl. v.* 4. 87. *Comp. ed.* 4. 144. *Forst. Tonbr.* 100.

E. n. 1290. *Hall. Hist. v.* 2. 149. *t.* 37. 2.

Ophrys Nidus avis. *Linn. Sp. Pl.* 1339. *Fl. Br.* 931. *Engl. Bot. v. 1. t.* 48. *Fl. Dan. t.* 181. *Ehrh. Phytoph.* 56. *Purt. v.* 2. 426.

Orchis abortiva fusca. *Bauh. Pin.* 86. *Rudb. Elys. v.* 2. 218. *f.* 1.

Nidus avis. *Raii Syn.* 382. *Dalech. Hist.* 1073. *f.* *Lob. Ic.* 195. *f.* *Best. Hort. Eyst. æstiv. ord.* 4. *t.* 4. *f.* 3.

Neottia. *Dod. Pempt.* 553. *f.*

Pseudo-leimodorum. *Clus. Hist. v.* 1. 270. *f.*

Satyrion abortivum, sive Nidus avis. *Ger. Em.* 228. *f.*

S. nonum. *Trag. Hist.* 795. *f.*

In shady woods, especially beech, on a chalky or loamy soil.

In Kent and Sussex. *Ray, Hudson.* In many parts of Scotland. *Hooker.* I have found it in several places in the north of England, as well as in Norfolk and Suffolk occasionally; but most abundantly in the fine beech woods about Hurley, Berks.

Perennial. *May, June.*

Root of innumerable, crowded, tufted, simple, thick, cylindrical, whitish, fleshy knobs, or radicles; for with their true nature nobody is as yet acquainted. They grow imbedded among dead leaves, at the roots of trees; but I could never, any more than Dr. Hooker, detect a parasitical attachment. The whole herb indeed has the true pallid hue, destitute of green, peculiar to parasitical plants in general, as the late Mr. Dryander long ago observed; and to which remark the generality of *Orchideæ* in India are no exception, their radicles being mostly nourished by rotten bark, not by the living tree. *Stem* solitary, erect, simple, angular, hollow, without leaves, but clothed with tubular, lax, membranous, obtuse, alternate sheaths. *Cluster* cylindrical, many-flowered, dense, except at the bottom, smooth. *Bracteas* oblong, small. *Fl.* pale brown in every part. *Cal.* and *pet.* moderately and equally spreading. *Lip* concave at the base; cloven at the extremity into 2 blunt, rounded, widely spreading lobes. *Column* cylindrical, without any hood. *Anth.* at the summit, in front, elliptical, convex, of 2 close, linear, parallel cells, depositing the yellow, finely granulated, simple, oblong masses of pollen on the back of the oblong upper lip of the stigma, the under lip of which is short and rounded. *Caps.* oval, with thick, almost woody, ribs and valves, crowned by the permanent column. *Seeds* numerous, minute, obovate, with a close tunic, not elongated at either end.

A recent comparison of this with *L. ovata* has satisfied me of the propriety of Mr. Brown's decision respecting its genus, and that the anther is no more a terminal lid in one than in the other. Neither does the nectary accord so well with *Epipactis* as with *Listera*.

*** *Anther terminal, fixed.*

418. EPIPACTIS. Helleborine.

Hall. Hist. v. 2. 147. Br. in Ait. H. Kew. ed. 2. v. 5. 201. Comp. ed. 4. 142. Willd. Sp. Pl. v. 4. 83. sect. 1. Sw. Orch. 62. t. 1. f. N. Serapias. Fl. Br. 942. Juss. 65. Gärtn. t. 14. Helleborine. Tourn. t. 249.

Cal. superior, of 3 ovate, acute, equal, more or less spreading, permanent leaves. *Pet.* 2, ovate, spreading, as long as the calyx. *Nect.* with little or no spur, not longer than the petals, dependent; concave at the base within the calyx; contracted in the middle; undivided at the end; disk tumid, lobed or furrowed. *Anth.* terminating the column, rounded, fixed, permanent, of 2 close parallel cells, depositing the obovate, powdery, undivided masses of *pollen* upon the stigma. *Germ.* obovate-oblong, angular, furrowed. *Style* somewhat elongated, incurved; convex at the back; concave in front. *Stigma* in front, close under the anther, prominent, angular, various in form, undivided. *Caps.* elliptic-oblong, angular, ribbed. *Seeds* small, roundish, with a lax *tunic*, greatly elongated at each end.

Roots creeping with rather stout fibrous *radicles*. *Herb* either smooth, or downy. *Stem* simple, erect, leafy. *Leaves* alternate, elliptic-oblong, or lanceolate, sessile, plaited, with numerous simple ribs. *Fl.* in terminal, bracteated, clusters or spikes, handsome. *Cal.* generally coloured.

1. *E. latifolia*. Broad-leaved Helleborine.

Leaves ovate, clasping the stem. Lower bracteas longer than the drooping flowers. Lip shorter than the calyx, entire, with a minute point. Germen downy.

E. latifolia. *Sw. Orch.* 64. *Willd. Sp. Pl. v. 4. 83. Br. as above, 201. Comp. ed. 4. 144. Hook. Scot. 254. Lond. t. 102. Forst. Tonb. 100. Besl. Hort. Eyst. æstiv. ord. 4. t. 5. f. 1; bad; fl. with spurs.*

E. n. 1297. Hall. Hist. v. 2. 154. t. 40. f. 2.

E. n. 4. Hall. in Act. Helvet. v. 4. 108.

E. sive Elleborine. Camer. Epit. 889. f.

Serapias latifolia. Linn. Syst. Nat. ed. 12. v. 2. 593. Fl. Br. 943. Engl. Bot. v. 4. t. 269. Freeman Ic. t. 3. Fl. Dan. t. 811. Gunn. Norveg. part 2. 122. t. 5. f. 3—6. Dicks. H. Sicc. fasc. 15. 17. Ehrh. Phytoph. 37.

42 GYNANDRIA—MONANDRIA. Epipactis.

S. Helleborine α . *Linn. Sp. Pl.* 1344.

Helleborine. *Ger. Em.* 442. f. *Dod. Pempt.* 384. f. *Lob. Ic.* 312. f.

H. latifolia montana. *Raii Syn.* 383. *Bauh. Pin.* 186.

β . *H. altera*, atro rubente flore. *Raii Syn.* 383. *Herb. Buddle.* *Bauh. Pin.* 186.

In shady mountainous woods and thickets.

β . On the sides of mountains near Malham, Settle, and other places in the north. *Ray, Mr. Woodward, & Mr. D. Turner.* At the bottom of the scar of Barrowfield wood, near Kendall. *Mr. Crowe.*

Perennial. *July, August.*

Root moderately creeping, with simple, downy radicles. *Stems* several, about 2 feet high, round, copiously leafy; sheathed at the base; most downy upwards. *Leaves* broadly ovate, acute, bright green, smooth, ribbed and plaited like those of a *Veratrum*; various in breadth; sheathing at the base; the upper ones gradually smaller and more lanceolate; all thin, rather rigid, not at all fleshy. *Cluster* erect, downy, of many alternate drooping flowers, on short partial stalks, with a linear-lanceolate bractea to each, of which 3 or 4 of the lowermost only reach beyond the flower, the rest being shorter. *Germen* obovate, downy. *Cal.* and *pet.* ovate, acute, nearly equal in size and colour, being all green, more or less tinged with brown or dull purple. *Nect.* shorter than either, its terminal lobe heart-shaped with a small acute point; the margin entire, a little wavy, purplish; disk tumid, smooth, dull red, or tawny. *Anth.* strictly terminal, broadly elliptical, deflexed, fixed, with 2 close elliptic-oblong cells, which deposit their simple yellow pollen-masses on the upper edge of the large, angular, prominent stigma.

β , preserved in Buddle's herbarium, is more downy, with later flowers, of a darker red in every part.

The flowers in Dr. Hooker's plate are of a light purple hue, different from any I have seen; their lip somewhat crenate, and the germen smooth. A specimen much like this figure, but in which the lip is perfectly entire, was sent me from Worcester-shire many years ago, as a new species. The reputed varieties of *E. latifolia* perhaps require more scientific examination than they have hitherto received. Ehrhart's *Serapias parvifolia*, *Herb.* 120, afterwards, as it seems, called by himself, to no purpose, *microphylla*, *Beitr.* v. 4. 42, in which change he is followed by Swartz, Willdenow and Hoffmann, may possibly be our β . Yet this appears, by my Swiss and Italian specimens, very distinct from the common *E. latifolia*. I have never met with it in Britain.

2. *E. purpurata*. Purple-leaved Helleborine.

Leaves ovate-lanceolate. Bracteas linear, all twice as long

as the flowers. Lip shorter than the calyx, entire. Ger-
men downy.

In shady woods.

Parasitical on the stump of a maple or hazel, in a wood near
the Noris farm, at Leigh, Worcestershire, in 1807. *Rev. Dr.*
Abbot.

Perennial. *June*.

“*Root* certainly parasitical. Whole plant, when fresh, glowing
with a beautiful red lilac colour;” changed in drying to a
tawny, not dark or black, brown, which it has since retained un-
altered. *Stem* about a foot high, round, finely downy, clothed
with alternate, sessile, many-ribbed, flat, not plaited, *leaves*,
about 2 inches long, their ribs and margins minutely rough;
the lower ones ovate-lanceolate; upper linear-lanceolate as
they approach the *flowers*. *Cluster* a little drooping, at least be-
fore the flowers expand, cylindrical, dense. *Bracteas* solitary
under each partial stalk, nearly erect, linear, acute, straight,
long and narrow, being more than twice the length of the un-
expanded *flowers*. The latter are numerous, crowded, mostly
full-grown, but not yet expanded. On immersion in boiling
water, they prove to have all the characters of an *Epipactis*, with
a *lip* like the foregoing species, quite entire at the margin, and
somewhat pointed. The *calyx* is externally downy, as well as
the *germen*.

Whether my late friend, to whom I am obliged for my only speci-
men, found any more, I cannot tell, but I hope this account
may lead to a further discovery of so curious and interesting a
plant, which cannot be referred to any known species.

3. *E. palustris*. Marsh Helleborine.

Leaves lanceolate, clasping the stem. Flowers drooping.
Lip rounded, obtuse, crenate, as long as the petals, with
a notched protuberance on the disk.

E. palustris. *Sw. Orch.* 64. *Willd. Sp. Pl.* v. 4. 84. *Br. as above*, 202.
Comp. ed. 4. 144. *Hook. Scot.* 254. *Lond. t.* 89.

E. n. 1296. *Hall. Hist.* v. 2. 154. *t.* 39.

E. n. 5. *Hall. in Act. Helvet.* v. 4. 111.

Serapias palustris. *Scop. Carn.* v. 2. 204. *Fl. Br.* 944. *Engl. Bot.*
v. 4. *t.* 270. *Lightf.* 527. *Curt. Cat. n.* 108.

S. longifolia. *Linn. Syst. Nat. ed.* 12. v. 2. 593. *Ehrh. Phyt.* 47.
Purt. v. 2. 429.

S. longifolia β, γ . *Linn. Sp. Pl.* 1345.

Helleborine. *Fl. Dan.* *t.* 267.

H. angustifolia palustris, sive pratensis. *Bauh. Pin.* 187. *Moris.*
v. 3. 487. *sect.* 12. *t.* 11. *f.* 7.

H. palustris nostras. *Raii Syn.* 384.

44 GYNANDRIA—MONANDRIA. *Epipactis*.

Elleborine recentiorum tertia. *Clus. Hist. v. 1. 273. f. good*, though the same as that given for *E. latifolia* by Gerarde, Dodonæus, &c. *Damasonium alpinum*, &c. *Bauh. Hist. v. 3. p. 2. 516. f. not descr.*

In watery places, or swampy meadows, especially on a chalky or gravelly soil.

Perennial. *July, August.*

Habit like the first species, but the *stem* not above 12 or 15 inches high. *Leaves* narrower and not plaited; the lowermost only inclining to ovate; the rest lanceolate, tapering to a point. *Fl.* fewer, larger, and very handsome. *Pet.* internally white, striped with crimson. *Lip* longer than the calyx, white, elegantly striped and variegated with crimson; its terminal lobe rounded, or heart-shaped, without a point, concave, strongly and unequally notched and crenate, the disk furnished at the base with an elevated notched crest. *Germen* downy.

Mr. Hudson, from some strange mistake, has asserted that this plant, if removed into a garden, or dry soil, changes the following year to *E. latifolia*. They are unquestionably perfectly distinct species. Linnæus unluckily gave the name of *longifolia* to this and others confounded with it, because among them are some long-leaved species; but *palustris* is more suitable, and has a prior right.

4. *E. grandiflora*. Large White Helleborine.

Leaves elliptic-lanceolate. Bractæas longer than the smooth germen. Flowers sessile, erect. Lip abrupt, shorter than the calyx, with elevated lines on the disk.

E. grandiflora. *Comp. ed. 4. 144. Sm. in Rees's Cycl. v. 13. n. 4. Prodr. Fl. Græc. v. 2. 220.*

E. pallens. *Sw. Orch. 65. Willd. Sp. Pl. v. 4. 85. Br. as above, 202. Hook. Scot. 254. Lond. t. 76. Fl. Dan. t. 1400.*

E. n. 1298, α. Hall. Hist. v. 2. 155. t. 41.

E. n. 3. Hall. in Act. Helvet. v. 4. 105.

E. angustis foliis. *Besl. Hort. Eyst. vern. ord. 9. t. 5. f. 2.*

Serapias grandiflora. *Linn. Syst. Nat. ed. 12. v. 2. 594. Scop. Carn. v. 2. 203. Fl. Brit. 944. Engl. Bot. v. 4. t. 271. Lightf. 528. Dicks. H. Sicc. fasc. 6. 18.*

S. Lonchophyllum. *Ehrh. in Linn. Suppl. 405. Phytoph. 57.*

S. longifolia. *Huds. 393.*

S. lancifolia. *Murr. in Linn. Syst. Veg. ed. 14. 815. Hull 197.*

Helleborine flore albo. *Bauh. Pin. 187. Raii Syn. 383. Ger. Em. 441, no f. Moris. v. 3. 488. sect. 12. t. 11. f. 12.*

H. latifolia, flore albo clauso. *Raii Syn. 384*; is as Dillenius observes, the very same.

Damasonium alpinum, sive Elleborine, floribus albis. *Bauh. Hist. v. 3. p. 2. 516*; descr. not the figure, which is *E. palustris*.

Alisma quorundam. *Cord. Hist. 150. 2. f.*

In woods and thickets, chiefly on a chalky soil.

In Stoken Church woods, Oxfordshire. *Ray*. Westmoreland. *Lawson*. Hertfordshire. *Dr. Eales*. Gloucestershire. *Rev. Mr. Baker*. Surrey. *Mr. Graves*. Rare in Scotland. *Lightfoot*. Plentiful, along with *Orchis bifolia*, in the beech woods above Hurley, and Bisham Abbey, Berks.

Perennial. *June*.

Root creeping. *Stem* about a foot high, round, leafy, smooth like the rest of the herb. *Leaves* rather elliptical than lanceolate, sessile, clasping, acute, many-ribbed, not plaited, of a fine green; the uppermost narrowest, and gradually diminishing to lanceolate spreading *bracteas*, longer than the flowers, except the upper ones, which are small and narrow, longer than the *germen*, which is slender and without any downiness. *Fl.* nearly or quite sessile, upright, large and handsome, but perfectly inodorous at all times; their *calyx* and *corolla* equally of a pure milk-white, though soon turning brownish, and the whole flower is seldom so fully expanded as the rest of the species. The concave, abrupt, scarcely pointed *lip* is marked above with three principal, and two smaller, yellow, elevated, not wavy, parallel lines.

It does not appear why Swartz changed the original and expressive name, *grandiflora*, for one that is equally applicable to the next species. The authority of Linnæus and Scopoli, to say nothing of others, ought to have been regarded by Willdenow, who might well have been corrected in the *Hort. Kew*.

5. *E. ensifolia*. Narrow-leaved White Helleborine.

Leaves lanceolate, pointed. Bracteas minute, much shorter than the smooth germen. Flowers sessile, erect. Lip abrupt, half as long as the calyx, with elevated lines on the disk.

E. ensifolia. *Sw. in Act. Holm. for 1800.* 232. *Willd. Sp. Pl.* v. 4. 85. *Br. as above,* 202. *Comp. ed.* 4. 144. *Hook. Scot.* 255. *Lond. t.* 77.

E. xiphophylla. *Sw. Orch.* 65.

E. n. 1298, β . *Hall. Hist. v.* 2. 155.

E. n. 3, *varietas* β . *Hall. in Act. Helvet. v.* 4. 107.

Serapias ensifolia. *Murr. in Linn. Syst. Veg. ed.* 14. 815; with erroneous synonyms. *Fl. Br.* 945. *Engl. Bot. v.* 7. t. 494. *Purt. v.* 2. 428. t. 4.

S. Xiphophyllum. *Ehrh. in Linn. Suppl.* 404. *Phytoph.* 67.

S. longifolia γ . *Huds.* 394.

S. grandiflora. *Fl. Dan. t.* 506.

Helleborine foliis prælongis angustis acutis. *Raii Syn.* 384. *Herb. Buddle*.

H. angustifolia, flore albo oblongo. *Merr. Pin.* 61.

46 GYNANDRIA—MONANDRIA. *Epipactis*.

H. montana angustifolia spicata. *Bauh. Pin.* 187.

Damasonium alpinum. *Dalech. Hist.* 1058. *f.?* *Bauh. Hist. v. 3.* p. 2. 517. *f.?*

In mountainous woods, but rarely.

In a wood near Ingleton, Yorkshire. *Mr. Newton and Dr. Richardson.* On the top of Aberley hill, and in Wire forest, Worcestershire. *Mr. Moseley.* In Oversley and Ragley woods. *Mr. Purtou.* In several parts of Kent and Surrey, along with *E. grandiflora.* *Mr. Graves.*

Perennial. *May, June.*

Root rather clustered than creeping, with oblong, or somewhat cylindrical, fleshy *knobs.* *Stem* above a foot high, leafy from top to bottom. *Leaves* numerous, alternate, imperfectly two-ranked, lanceolate, twice the length of the preceding, yet scarcely half so broad; the uppermost tapering to a slender point. The line is very decidedly drawn between them and the *bracteas*, the latter, except perhaps the lowermost occasionally, being all very minute, not one fourth so long as the *germen*, sharp-pointed, often hardly discernible. *Fl.* sessile, nearly or quite erect, scentless, pure white in every part, except a yellow protuberance on the *lip*, whose disk bears several white, even, elevated ribs, turning yellowish as they fade. Masses of *pollen* yellow, oblong, cloven half way down. *Stigma* peltate, angular. The *lip* has the rudiment of a *spur* behind.

6. *E. rubra.* Purple Helleborine.

Leaves lanceolate. *Bracteas* longer than the downy *germen.* *Flowers* sessile, erect. *Lip* tapering to a point, with elevated undulating lines on the disk.

E. rubra. *Sw. Orch.* 65. *Willd. Sp. Pl. v. 4.* 86. *Br. as above,* 202. *Comp. ed.* 4. 144. *Prodr. Fl. Græc. v. 2.* 221.

E. n. 1299. *Hall. Hist. v. 2.* 156. *t.* 42.

E. n. 2. *Hall. in Act. Helvet. v. 4.* 103.

Serapias rubra. *Linu. Syst. Nat. ed. 12. v. 2.* 594. *With.* 42. *Fl. Br.* 946. *Engl. Bot. v. 7. t.* 437. *Ehrh. Phytoph.* 97.

S. longifolia δ . *Huds.* 394.

Helleborine. *Fl. Dan. t.* 345.

H. montana angustifolia purpurascens. *Bauh. Pin.* 187. *Raii Syu.* 384. *Pluk. Almag.* 182.

H. angustifolia sexta *Clusii.* *Ger. Em.* 442. *f.*

Elleborine recentiorum sexta. *Clus. Hist. v. 1.* 273. *f.*

E. quinta. *Clus. Pan.* 276. *f.*

Damasonium purpureum dilutum, sive Elleborine 4 (6) *Clusii.* *Bauh. Hist. v. 3. p. 2.* 516. *f.* 517.

In stony mountainous woods; very rare.

In Ireland. *Plukenet.* Gloucestershire. *Rev. Mr. Baker.* On a

steep stony bank, sloping to the south, on Hampton Common, Gloucestershire. *Mrs. Smith of Barnham House.*

Perennial. *June, July.*

Root horizontal, fleshy, gradually creeping, with numerous fibres.

Stem erect, above a foot high, sheathed with a few scales at the bottom, and bearing higher up several lanceolate, tapering, ribbed *leaves*, above which the stem is more or less downy.

Bractes linear-lanceolate, longer than the *germen*, which is downy, not smooth. *Fl.* sessile, very handsome. *Cal.* and *Pet.* all directed upwards, ovate, taper-pointed, of a uniform rose-colour, as well as the *column*. *Lip* slightly protuberant between the calyx-leaves behind; in front as long as the calyx, but deflexed; white, rounded, and doubly lobed, at the sides; white in the disk with several thin, wavy, elevated ribs; the point elongated, tapering, acute, red at the edges. Masses of *pollen* greyish, oblong, slightly cloven. *Stigma* peltate, concave.

The plants composing this very natural genus could be but little known to Linnæus when he so strangely confounded them in his *Species Plantarum*. Haller wrote an elaborate paper on the *Orchideæ*, professedly to correct his errors. Hence the present genus especially, comprehended under the Linnæan *Serapias*, appears materially improved, in the *Systema Naturæ* and *Systema Vegetabilium*, where Haller's corrections are adopted. Yet the labours of these great men have by no means reached perfection, either with regard to the discrimination of very dissimilar species or their synonyms. Old authors indeed are so full of mistakes respecting the latter, that the greatest attention is requisite to understand what they mean, and they often misunderstand each other. Recent writers have not been more happy as to nomenclature, which they have rather confounded than improved.

**** *Anther a terminal deciduous lid.*

419. MALAXIS. Bog-orchis.

Sw. Orch. 68. t. 1. f. P. *Schreb. Gen.* 603. *Willd. Sp. Pl.* v. 4. 89.

Sm. in Rees's Cycl. v. 22. *Fl. Br.* 940. *Comp. ed.* 4. 142. *Br. in Ait. H. Kew.* v. 5. 208.

Flower reversed. *Cal.* superior, of 3 oblong, spreading, equal, permanent leaves. *Pet.* 2, spreading, oblong, smaller than the calyx. *Nect.* without a spur, variously shaped, undivided or lobed, longer or shorter than the petals, embracing the column with its concave base. *Anth.* terminal, hemispherical, deciduous, of 2 close cells, depositing the four masses of *pollen* upon the stigma. *Germ.* obovate, angular. *Style* various in length; convex

at the back; flat or concave in front. *Stigma* close beneath the anther in front, obsolete. *Caps.* elliptic-oblong, with 3 or 6 ribs. *Seeds* numerous, minute, each with a lax chaffy *tunic*.

Roots somewhat bulbous, with inferior *radicles*. *Leaves* ovate, or lanceolate, mostly radical. *Flower-stalk* central, angular. *Fl.* clustered, small, greenish.

1. *M. paludosa*. Least Bog-orchis.

Leaves about four, spatulate; rough at the tip. Stalk with five angles. Lip entire, concave, erect, acute, half the length of the calyx.

M. paludosa. *Sw. in Stockh. Trans. for 1789.* 127. t. 6. f. 2. *Willd. Sp. Pl.* v. 4. 91. *Fl. Br.* 940. *Engl. Bot.* v. 1. t. 72. *Forst. Tonbr.* 101. *Hook. Scot.* 255.

Ophrys paludosa. *Linn. Sp. Pl.* 1341. *Fl. Suec. ed.* 2. 316. *Rose Elem. app.* 450. t. 2. f. 3. *Huds.* 389. *Dicks. H. Sicc. fasc.* 7. 16. *Fl. Dan.* t. 1234. *Ehrh. Phytoph.* 16.

O. palustris. *Huds. ed.* 1. 339.

Ophris bifolia palustris nostras. *Pluk. Phyt.* t. 247. f. 2.

O. bifolia minor palustris. *Pluk. Almag.* 270.

Orchis minima bulbosa, D. Preston. *Raii Hist.* v. 3. 587. *Dill. in Raii Syn.* 378.

Bifolium palustre. *Raii Syn. ed.* 2. 243. *ed.* 3. 385.

In spongy turfy bogs.

Near Gamlingay, Cambridgeshire; also between Hatfield and St. Albans, and in Romney marsh. *Ray*. At Hurst hill, Tonbridge wells; Buboia. *Dill*. Not found there by Mr. Forster. On Felthorpe bogs, to the north of Norwich. *Mr. Charles Bryant*. Near Potten, Bedfordshire. *Rev. Dr. Abbot*. Durham. *Rev. Mr. Harriman*.

Perennial. *July*.

Root bulbous, sheathed, increasing by offsets, often stalked, and throwing out *radicles* from the base. *Herb* the smallest of our native *Orchideæ*, and probably of the whole tribe. *Leaves* 3 or 4, ovate, or obovate, various in length, rather glaucous, almost upright, obtuse, roughish about the extremity, often somewhat fringed, so that this plant may perhaps have given rise to the report of a hairy-leaved *Orchis*, in *Lob. Ic.* 186. *Ger. Em.* 219, and *Bauh. Pin.* 84; somewhat caricatured in *Rudb. Elys.* v. 2, 207. f. 2. *Stalk* from 2 to 4 inches high, angular, smooth, bearing a dense cluster of very small, pale green, reversed flowers, the upper leaf of the calyx being turned downward, the 2 others, with the small entire lip, upward. *Pet.* reflexed. *Caps.* almost globular. *Bractees* lanceolate, small, membranous.

I had once taken Plukenet's figure for *M. Læselii*, see *Engl. Bot.*

72 ; but this error is corrected in *Fl. Br.* Mr. Hudson had no practical knowledge of these two plants when he published his first edition ; neither had Dillenius at any time.

2. *M. Læselii*. Two-leaved Bog-orchis.

Leaves two, elliptic-lanceolate. Stalk triangular. Petals linear. Lip obovate, channelled, undivided, recurved, longer than the calyx.

M. Læselii. *Sw. Orch.* 71. *Willd. Sp. Pl.* v. 4. 92. *Sm. in Rees's Cycl.* n. 13. *Comp. ed.* 4. 145.

Cymbidium Læselii. *Sw. in Nov. Act. Ups.* v. 6. 76.

Ophrys Læselii. *Linn. Sp. Pl.* 1341. *Fl. Suec. ed.* 2. 316. *Fl. Br.* 935. *Engl. Bot.* v. 1. t. 47. *Relh.* 348. *Dicks. H. Sicc. fasc.* 9. 11. *Ehrh. Herb.* 110.

O. lilifolia. *Huds.* 389.

O. paludosa. *Fl. Dan.* t. 877.

Ophris diphyllus bulbosa. *Læs. Pruss.* 180. t. 58.

O. bifolia bulbosa. *Ger. Em.* 403. f. *Bauh. Pin.* 87.

Chamæorchis lilifolia. *Bauh. Pin.* 84.

Bifolium bulbosum. *Dod. Pempt.* 242. f.

Pseudo-orchis bifolia palustris. *Raii Syn.* 382.

Orchis lilifolius minor sabuletorum Zelandiæ et Bataviæ. *Bauh. Hist.* v. 2. 770. f. 1, 2 ; not 3. *Lob. Advers.* 506. f. 1, 2. *Raii Cant.* 105.

On sandy bogs, among Rushes.

On Hinton and Teversham moors near Cambridge. *Ray, Relhan, St. Faith's* Newton bogs, near Norwich. *Mr. Pitchford.* Roydon fen, Norfolk, near Diss. *Mr. Woodward.* Bogs near Tudenham, Suffolk. *Sir T. G. Cullum, Bart.*

Perennial. *July.*

Three or four times as large as the preceding, especially the leaves which are almost universally two, of equal size, elliptic-lanceolate, entirely smooth, bright green, with one central rib and many small ones ; their bases elongated and sheathing. *Bulb* ovate, greenish, enveloped in soft pale scales, increasing by one or more lateral offsets from the base, and sending down, from the same part, many simple, wavy *radicles*. *Stalk* from between the leaves, and about twice their height, triangular, smooth, naked. *Cluster* of from 3 or 4 to 8 *flowers* much larger than those of *M. paludosa*, but with smaller *bractæas*. *Calyx-leaves* spreading, lanceolate, bluntish, of a pale lemon-colour. *Pet.* longer and narrower, linear, likewise spreading, and of nearly the same hue. *Lip* of a deeper yellow, rather longer than the petals, obovate, folded, or channelled, wavy, or slightly crenate, *Germen* obovate. *Caps.* elliptic-obovate, with 6 ribs.

420. CORALLORRHIZA. Coral-root.

Hall. Hist. v. 2. 159. Br. in Ait. H. Kew. ed. 2. v. 5. 209. Comp. ed. 4. 142.

Cal. superior, of 3 lanceolate, spreading, almost equal, permanent leaves. *Pet.* 2, oblong, or lanceolate, ascending, nearly the length of the calyx. *Nect.* with more or less of a *spur* which is either prominent or not, the *lip* more or less three-lobed, rounded at the end, rather shorter than the calyx. *Anth.* terminal, hemispherical, deciduous, of 2 close cells, depositing the four masses of *pollen* upon the stigma. *Germ.* obovate-oblong. *Style* shorter than the petals, unconnected with them, incurved; convex behind; channelled in front. *Stigma* obsolete, beneath the anther in front. *Caps.* elliptic-oblong. *Seeds* numerous, extremely minute, roundish, each with a long, lax, white, chaffy *tunic*.

Root tuberous, fleshy, branched, horizontal, beset irregularly with shortish, simple, fibrous *radicles*. *Leaves* none, except a few sheathing scales, on the simple, radical *stalk*. *Cluster* erect, of several bracteated particoloured *flowers*. *Spur* obtuse, sometimes hardly discernible, always shorter than the *germen*. *Capsule* pendulous. Natives of Europe, North America, and Nepaul. Six species are known.

1. *C. innata*. Spurless Coral-root.

Spur of the nectary short, not distinct from the slightly three-lobed lip. Root copiously branched.

C. innata. *Br. as above. 209. Comp. ed. 4. 145. Hook. Scot. 255. Lond. t. 142.*

C. n. 1301. Hall. Hist. v. 2. 159. t. 44.

Cymbidium corallorrhizon. Sw. Orch. 77. Willd. Sp. Pl. v. 4. 109.

Ophrys corallorrhiza. Linn. Sp. Pl. 1339. Lapl. Tour v. 1. 222. f. 223. Fl. Br. 932. Engl. Bot. v. 22. t. 1547. Lightf. 523. t. 23. Fl. Dan. t. 451. Gunn. Norveg. p. 1. 54. p. 2. t. 6. f. 3.

Orobanche radice coralloide. Bauh. Pin. 88. Rudb. Elys. v. 2. 231. f. 9. Meutz. Pugill. t. 9.

O. sveonum, radice coralloides, flore albo. Rudb. Elys. v. 2. 234. f. 16.

O. spuria, seu corallorrhiza. Rupp. Jen. ed. 1. 284. f.

Rhizocorallon. Hall. in Rupp. Jen. ed. 3. 301.

Dentaria coralloide radice. Clus. Hist. v. 2. 120. f. Pann. 450. f. Besl. Hort. Eyst. æstiv. ord. 4. t. 4. f. 4.

D. minor. Ger. Em. 1585. f.

In marshy umbrageous woods in Scotland, but rarely.

Found in one place only, and there sparingly; in a moist hanging wood, on the south side, near the head of Little Loch Broom, Ross-shire. *Lightfoot*. In Methuen wood, 6 miles from Perth. *Mr. Thomas Bishop*, 1804. In a peat bog among willows, a little to the south of Dalmahoy hill, 9 miles from Edinburgh. *Mr. Edward John Maughan*, 1807. At Ravelrig; *Dr. Greville*. *Hooker*.

Perennial. *May, June*.

Root fleshy, of numerous, compound, divaricated, horizontal branches, spreading about 2 inches, pale brownish or yellowish, the lobes blunt and all distinct, not touching each other. When beginning to dry it exhales the sweet and powerful scent of *Vanilla*, which is not entirely lost after the specimens have been preserved for 20 years. One root sent by *Mr. Maughan* in wet moss, and so kept in a pot, with plenty of water, blossomed the same summer. *Leaves* none. *Stalks* solitary, erect, a span high, angular, smooth, clothed in their lower half with a few distant, tubular, loosely sheathing scales, $1\frac{1}{2}$ inch long. *Cluster* of from 5 to 10 drooping, pale yellowish *flowers*, on short partial stalks, with a very small acute *bractea* at the base of each stalk. *Germen* smooth, incurved, bluntly angular. *Calyx-leaves* lanceolate, spreading, greenish with a tinge of red. *Pet.* lanceolate, pale yellow, often reddish at the point, converging under the upper calyx-leaf. *Lip* recurved, obovate, with a slight contraction in the middle, below which, towards the base, are two shallow rounded lobes, the whole white or pale yellow, more or less spotted with red; the *spur* not apparent, but *Mr. Brown* conceives it to be entirely united to the base of the lip, and very short. Some traces of a *spur* certainly exist in all the other species. *Column* yellowish; convex at the back; channelled in front; crowned with the vertical *anther* in the form of a lid, and attached behind as by a hinge. *Pollen-masses* 2 in each cell, "ovate, white." *Hooker*. *Caps.* elliptical, with 3 blunt ribs, and crowned with the permanent withered flower.

GYNANDRIA DIANDRIA.

421. CYPRIPEDIUM. Ladies' Slipper.

Linn. Gen. 464. *Juss.* 65. *Fl. Br.* 941. *Lam. t.* 729. *Br. in Ait. Hort. Kew. ed. 2. v. 5.* 220.
Calceolus. Tourn. t. 249.

Cal. superior, of 3 ovate-lanceolate, taper-pointed, spreading, coloured leaves; the upper one broadest; 2 lowermost generally combined nearly their whole length. *Pet.*

2, about the same length, or longer, spreading, linear-lanceolate, pointed, wavy. *Nect.* without a *spur*; *lip* obovate, inflated, obtuse, membranous, prominent, mostly shorter than the petals, with an irregular longitudinal fissure above. *Filam.* 2, on the *column*, lateral, opposite, spreading, oblong, fleshy. *Anth.* lateral, elliptical. *Germ.* oblong, triangular, furrowed. *Style* short and stout, somewhat compressed, bearing the stamens, and terminating above them in a dilated, flattish, horizontal lobe, or appendage, in the place, as Mr. Brown justly indicates, of a third stamen. *Stigma* beneath this appendage, and parallel to it, in like manner dilated and flattened, but smaller. *Caps.* elliptic-oblong, obtuse, angular, furrowed. *Seeds* oblong, numerous.

Roots creeping. *Stem* simple, erect, mostly leafy. *Leaves* elliptical, acute, many-ribbed, plaited, entire. *Fl.* terminal, mostly solitary, large and handsome, without scent.

1. *C. Calceolus*. Common Ladies' Slipper.

Stem leafy. Appendage to the column elliptical, obtuse, channelled. *Lip* somewhat compressed, shorter than the petals.

C. Calceolus. *Linn. Sp. Pl.* 1346. *Willd. v.* 4. 142. *Fl. Br.* 941. *Engl. Bot. v.* 1. *t.* 1. *Hook. Lond. t.* 42. *Salisb. in Tr. of L. Soc. v.* 1. 76. *t.* 2. *f.* 1. *Fl. Dan. t.* 999. *Redout. Liliac. t.* 19.

C. radibus fibrosis, foliis ovato-lanceolatis caulinis. *Linn. in Act. Ups.* 1740. 24. *Mill. Ic.* 162. *t.* 242.

Calceolus n. 1300. *Hall. Hist. v.* 2. 157, *t.* 43.

C. n. 4. *Gmel. Sib. v.* 1. 2. *t.* 1. *f.* 1.

C. Marianus. *Dod. Pempt.* 180. *f.*

C. Mariæ. *Raii Syn.* 385. *Ger. Em.* 443. *f.* *Lob. Ic.* 312. *f.* *Besl. Hort. Eyst. vern. ord.* 8. *t.* 6. *f.* 1.

Damasonii species quibusdam, sive *Calceolus D. Mariæ.* *Bauh. Hist. v.* 3. *p.* 2. 518. *f.*

Helleborine flore rotundo, sive Calceolus. *Bauh. Pin.* 187.

Elleborine recentiorum prima. *Clus. Hist. v.* 1. 272. *f.*

E. ferruginea. *Dalech. Hist.* 1146. *f.*

In mountainous woods and thickets, in the north of England, very rare.

In Lancashire, and in Helks wood by Ingleborough, Yorkshire. *Ray.* In the county of Durham. *Rev. Mr. Rudston.* Near Arncliffe, Yorkshire. *Hooker.*

Perennial. *June.*

Root tuberous, branching, creeping horizontally, with numerous, simple, fleshy, smooth, fibres. *Stems* solitary, 12 or 18 inches high, solid, striated, downy, bearing 3 or 4 large, alternate,

ovate, rather pointed, slightly downy *leaves*, clasping or sheathing at their base; the uppermost, especially if there be two flowers, diminished to a lanceolate *bractea*. *Fl.* terminal, usually solitary, sometimes two, one above the other, large and conspicuous. *Calyx-leaves* ribbed, $1\frac{1}{2}$ inch long, of a singular rich and dark brown; the 2 lowermost combined. *Pet.* of the same colour, rather longer and narrower, slightly wavy. *Lip* tumid, yellow, wrinkled, reticulated with veins, internally spotted, about an inch long. *Appendage* to the *column* elliptical, with 2 angles, more or less blunt, at the base; the extremity rounded, with a short inflexed point, which latter is not shown in the figures of Mr. Salisbury or Dr. Hooker. Mr. Sowerby's figure in *Engl. Bot.* has been unjustly criticised. It was necessarily taken from a garden specimen, but will on examination be found precisely conformable to nature, as well as to Haller's excellent plate, the most correct in detail of any that has been given of the present species. The American *C. parviflorum* is totally different.



GYNANDRIA HEXANDRIA.

422. ARISTOLOCHIA. Birthwort.

Linn. Gen. 467. *Juss.* 73. *Fl. Br.* 947. *Tourn. t.* 71. *Lam. t.* 733. *Gærtn. t.* 14.

Nat. Ord. Sarmenaceæ. *Linn.* 11. Subsequently removed by him to the *Rhœadeæ.* 27. *Aristolochiæ.* *Juss.* 23. See *Grammar* 85.

Cal. superior, of 1 leaf, tubular, coloured, permanent; tumid, and nearly globose, at the base; limb dilated; either lobed and equally spreading, or unilateral and undivided. *Cor.* none. *Filam.* none, except the notched cup, crowning the germen, within the calyx, may be so denominated. *Anth.* 6, sessile on the outer surface of this cup, vertical, each of 2 oblong, separated, parallel, bivalve cells. *Germ.* inferior, oblong, angular. *Style* scarcely any. *Stigma* nearly globular, with 6 deep lobes; the summit concave. *Caps.* large, oval, with 6 angles, 6 cells, and 6 valves, with double partitions from their inflexed margins. *Seeds* numerous in each cell, depressed, horizontal, lying over each other, triangular, with a dilated or thickened margin; "*albumen* heart-shaped." *Gærtner*; "*embryo* certainly proving dicotyledonous in germination." *Jussieu*.

Perennial, herbaceous or shrubby, erect, or more generally climbing. *Leaves* alternate, stalked, simple, very seldom lobed, usually heart-shaped. *Fl.* axillary, stalked. The analogy of *Asarum*, v. 2. 242, must justify us in calling a *calyx* what Linnæus and others have taken for a *corolla*.

1. *A. Clematitis*. Common Birthwort.

Leaves heart-shaped. Stem erect. Flowers aggregate, upright. Calyx unilateral.

A. Clematitis. *Linn. Sp. Pl.* 1364. *Willd. v.* 4. 163. *Fl. Br.* 947. *Engl. Bot. v.* 6. t. 398. *Willd. suppl. t.* 238. *Mill. Illustr. t.* 75. *Hook. Lond. t.* 149. *Dicks. Dr. Pl.* 14. *Bull. Fr. t.* 39. *Fl. Dan. t.* 1235. *Lob. Ic.* 607.f.

A. n. 1029. *Hall. Hist. v.* 1. 240.

A. Clematitis recta. *Bauh. Pin.* 307. *Mill. Ic.* 34. t. 51.f. 1.

A. Clematitis vulgaris. *Clus. Hist. v.* 2. 71.f.

A. multiflora. *Riv. Monop. Irr. t.* 116.

A. longa. *Trag. Hist.* 178.f. *Matth. Valgr. v.* 2. 13.f. *Dalech. Hist.* 977.f.

A. longa vulgaris. *Camer. Epit.* 421.f. *Besl. Hort. Eyst. æstiv. ord.* 4. t. 3.f. 2.

A. rotunda. *Fuchs. Hist.* 90.f.

A. Saracenica. *Ger. Em.* 847.f. *Dalech. Hist.* 979.

In woods, thickets, and especially among the ruins of nunneries.

In a wood two miles from Thorndon, Essex; also in Cambridgeshire. *Blackstone*. Near Maidstone, and in other parts of Kent. *Huds.* At Godstow nunnery. *Sibth.* Sturston, near Diss. *Mr. Woodward*. Carrow abbey, near Norwich. *Rev. Dr. Sutton*. Kencot, Oxfordshire. *Bishop of Carlisle*.

Perennial. *July, August*.

Roots creeping deep in the ground, long, slender, difficult of extirpation. *Herb* smooth, bright green. *Stems* about 2 feet high, upright, zigzag, not climbing, round, leafy, striated, unbranched. *Leaves* rather coriaceous, without *stipulas*, heart-shaped with a wide space at the base, entire, with pedate ribs. *Fl.* several from the bosom of each leaf, on simple stalks, erect, pale yellow, or buff-coloured, without scent, scarcely perfecting any *fruit*, except by the assistance of some small insect; see *Introduct. to Botany*, ed. 5. 273.

The bitter acrid *roots* of this genus have, from remote antiquity, been celebrated for their stimulating effects on the female constitution; and the present species, though dangerously emetic, seems to have been greatly in use in this country, still retaining a place in our catalogues of medicinal plants. A singular opinion is said to prevail in France, that this *Aristolochia*, if abundant in vineyards, spoils the quality of the wines.

Class XXI. MONOECIA.

*Stamens and Pistils in separate flowers,
on the same plant.*

Order I. MONANDRIA. Stamen 1.

423. EUPHORBIA. *Involucrum* with numerous barren fl.
and 1 fertile.

Barr. fl. Cal. none. Cor. none.

Fert. fl. Cal. none. Cor. none. Caps. 3-lobed.
Styles 3, cloven.

424. ZANNICHELLIA. *Invol.* none.

Barr. fl. Cal. none. Cor. none.

Fert. fl. Cal. of 1 leaf. Cor. none. Germ. 4, or
more. Seeds 4, stalked. Stigmas peltate.

Callitriche, Chara? Zostera? Typha minor.

(DIANDRIA. Stam. 2.)

Carex.

Order II. TRIANDRIA. Stamens 3.

426. SPARGANIUM. *Barr. fl.* Cal. 3-leaved. Cor. none.
Fert. fl. Cal. 3-leaved. Cor. none. Drupa dry.

427. CAREX. *Barr. fl.* Catkin imbricated. Cal. a scale.
Cor. none.

Fert. fl. Catkin imbric. Cal. a scale. Cor. a hol-
low permanent glume, investing the loose seed.

428. KOBRESIA. *Barr. fl.* Catkin with opposite scales,
imbricated in 2 rows. Cal. inner scale. Cor. none.

Fert. fl. Cal. outer scale. Cor. none. Seed 1, loose.

425. TYPHA. *Barr. fl.* Catkin hairy. Cal. none. Cor.
none. Anth. about 3 on each filament.

Fert. fl. Catkin hairy. Seed 1, on a hairy stalk.

Amaranthus.

Order III. TETRANDRIA. Stam. 4.

429. LITTORELLA. *Barr. fl.* Cal. 4-leaved. Cor. 4-cleft. *Stam.* capillary, very long.
Fert. fl. Cal. none. Cor. unequally 3- or 4-cleft.
Style very long. *Nut* of one cell.
432. URTICA. *Barr. fl.* Cal. 4-leaved. *Petals* none. *Nect.* central, cup-shaped. *Stam.* the length of the *calyx*.
Fert. fl. Cal. 2-leaved. Cor. none. *Seed* 1, superior, polished.
431. BUXUS. *Barr. fl.* Cal. 3-leaved. *Pet.* 2. Rudiment of a *germen*.
Fert. fl. Cal. 4-leaved. *Pet.* 3. *Styles* 3. *Caps.* with 3 beaks and 3 cells. *Seeds* 2.
430. ALNUS. *Barr. fl.* Cal. scale of a *catkin*, permanent. 3-flowered. Cor. deeply 4-cleft.
Fert. fl. Cal. scale of a *catkin*, permanent, 2-flowered. Cor. none. *Styles* 2. *Nut* compressed, without wings.

Eriocaulon. Myrica.

Order IV. PENTANDRIA. Stam. 5.

433. XANTHIUM. *Barr. fl.* Common Cal. imbricated, many-flowered, with intermediate scales. Cor. of 1 petal, funnel-shaped, 5-cleft.
Fert. fl. Cal. of 2 leaves, with 2 flowers. Cor. none. *Drupa* spurious, coated with the prickly calyx, cloven. *Nut* of 2 cells.
434. AMARANTHUS. *Barr. fl.* Cal. of 3 or 5 leaves. Cor. none. *Stam.* 3 or 5.
Fert. fl. Cal. of 3 or 5 leaves. Cor. none. *Styles* 3 or 2. *Caps.* of 1 cell, bursting all round. *Seed* 1.
435. BRYONIA. *Barr. fl.* Cal. with 5 teeth. Cor. 5-cleft. *Filam.* 3. *Anth.* 5.
Fert. fl. Cal. with 5 teeth, deciduous. Cor. 5-cleft. *Style* 3-cleft. *Berry* inferior. *Seeds* few.

Fagus. Quercus. Atriplex.

Order V. HEXANDRIA. Stam. 6.

436. ERIOCAULON. Common *Calyx* imbricated, many-flowered.
Barr. fl. in the middle. Cor. in 6 or 4 deep segments. *Stam.* 6, 4, or 3.

Fert. fl. in the circumference. *Pet.* 6 or 4. *Style* 1.
Caps. superior, 2- or 3-lobed. *Seeds* solitary.

Rumices. Quercus.

Order VI. POLYANDRIA. Stam. 7, or more.

438. MYRIOPHYLLUM. *Barr. fl.* *Cal.* 4-leaved.
Pet. 4. *Stam.* 8.

Fert. fl. *Cal.* 4-leaved. *Pet.* 4. *Stigm.* 4, sessile.
Drupas 4.

441. POTERIUM. *Barr. fl.* *Cal.* 3-leaved. *Cor.* deeply
 4-cleft. *Stam.* 30-50.

Fert. fl. *Cal.* 3-leaved. *Cor.* deeply 4-cleft. *Pist.*
 1 or 2. *Nut* coated, of 1 or 2 cells.

439. SAGITTARIA. *Barr. fl.* *Cal.* 3-leaved. *Pet.* 3.
Stam. about 24.

Fert. fl. *Cal.* 3-leaved. *Pet.* 3. *Pist.* numerous.
Seeds numerous, bordered.

437. CERATOPHYLLUM. *Barr. fl.* *Cal.* many-cleft.
Cor. none. *Stam.* 16-20.

Fert. fl. *Cal.* many-cleft. *Cor.* none. *Stigma* nearly
 sessile, oblique. *Drupa* compressed.

443. FAGUS. *Barr. fl.* in a *catkin.* *Cal.* in several seg-
 ments. *Cor.* none. *Stam.* 5-20.

Fert. fl. *Cal.* double; *outer* inferior, prickly, in se-
 veral deep segments, 2- or 3-flowered; *inner* supe-
 rior, 5- or 6-cleft. *Cor.* none. *Styles* 5 or 6. *Nuts* 2
 or 3, loosely invested with the spreading outer
 calyx.

442. QUERCUS. *Barr. fl.* in a *catkin.* *Cal.* in several
 segments. *Cor.* none. *Stam.* 8 or more.

Fert. fl. *Cal.* double; *outer* inferior, scaly, undivided;
inner superior, in 6 deep segments. *Cor.* none.
Style 1. *Nut* solitary, closely invested, at its base,
 with the hemispherical outer calyx.

446. CORYLUS. *Barr. fl.* in a *catkin.* *Cal.* a 3-cleft *scale.*
Cor. none. *Stam.* 8 or more.

Fert. fl. *Cal.* double; *outer* inferior, divided; *inner*
 superior, obsolete. *Cor.* none. *Styles* 2. *Nut* soli-
 tary, bony, invested with the enlarged, coriaceous,
 jagged outer calyx.

445. *CARPINUS*. *Barr. fl.* in a *catkin*. *Cal.* a rounded *scale*. *Cor.* none. *Stam.* 10, or more.
Fert. fl. *Cal.* double; *outer* inferior, of several deciduous *scales*; *inner* superior, in 3 deep, sharp segments, permanent. *Cor.* none. *Styles* 2. *Nut* ovate, angular, naked.
444. *BETULA*. *Barr. fl.* in a *catkin*. *Cal.* a ternate *scale*.
Cor. none. *Stam.* 10-12.
Fert. fl. in a *catkin*. *Cal.* apeltate, 3-lobed, 3-flowered *scale*. *Cor.* none. *Styles* 2. *Nut* winged, deciduous.
440. *ARUM*. *Common Cal.* a sheathing leaf, enclosing a *common stalk*, naked above. *Cor.* none.
Barr. fl. *Stam.* numerous, in a dense ring, surmounted by another ring of abortive filaments.
Fert. fl. *Germ.* numerous, in a dense ring, below the stamens, sessile. *Styles* none. *Stigm.* downy. *Berry* with several *seeds*.

Order VII. *MONADELPHIA*. *Filaments*
united below.

447. *PINUS*. *Barr. fl.* in a *catkin*, naked. *Stam.* numerous, on a common stalk.
Fert. fl. in a *catkin*, of close, rigid, 2-lipped, 2-flowered *scales*. *Seeds* 2 to each *scale*, winged.
- Typha?*



MONOECIA MONANDRIA.

423. *EUPHORBIA*. *Spurge.*

Linn. Gen. 243. *Juss.* 385. *Fl. Br.* 513. *Lam. t.* 411.

Tithymalus. Tourn. t. 18. *Gærtn. t.* 107.

Nat. Ord. Tricoccæ. *Linn.* 38. *Euphorbiæ.* *Juss.* 96.

Involucrum of 1 leaf, tumid, with 4 or 5 marginal lobes permanent, containing 12 or more *barren flowers*, intermixed with narrow bristly *scales*; and 1 central *fertile flower*; all stalked, and destitute of *calyx*, as well as of *corolla*.
Nect. 4 or 5, alternate with the lobes of the *Involucrum*,

fleshy, coloured, more or less lobed, or crescent-shaped, tumid, abrupt.

Barr. fl. Filam. simple, capillary, erect, its origin marked by a joint, often coloured, at the summit of the partial stalk. *Anth.* of 2 globose distinct lobes.

Fert. fl. on a longer partial stalk, prominent, mostly deflexed to one side. *Germ.* roundish, 3-lobed. *Styles* 3, terminal, equal, cloven about half way down, spreading, permanent. *Stigmas* bluntish. *Caps.* roundish, 3-lobed, of 3 cells, and 3 valves, with partitions from the centre of each, bursting elastically. *Seeds* solitary, large, roundish, smooth or dotted.

Herbaceous or shrubby, abounding with white milky juice, which by drying becomes a brown acrid gum-resin. *Stem* (in all ours) round, leafy. *Leaves* simple, undivided, mostly scattered; sometimes downy. *Fl.* either axillary, or on forked, bracteated stalks, partly collected into umbels. *Nect.* brown, purplish, or yellow.

* *Stem forked.*

1. E. *Peplis*. Purple Spurge.

Leaves nearly entire, half-heartshaped. Involucrums solitary, axillary. Stems procumbent. Capsule smooth.

E. Peplis. *Linn. Sp. Pl.* 652. *Willd. v. 2.* 899. *Fl. Br.* 513. *Engl. Bot. v. 28. t.* 2002.

Tithymalus maritimus supinus annuus, Peplis dictus. *Raii Syn.* 313.

Peplis. *Matth. Valgr. v. 2.* 599. *f. Camer. Epit.* 970. *f. Ger. Em.* 503. *f. Lob. Ic.* 363. *f. Clus. Hist. v. 2.* 187. *f. Dalech. Hist.* 1659. *f.*

P. maritima, folio obtuso. *Bauh. Pin.* 293.

Peplion. *Dalech. Hist.* 1659. *f.*

Sea Dwarf Spurge. *Petiv. H. Brit. t.* 53. *f.* 12.

On the sandy sea coast of the south-west part of England.

Between Pensans and Marketjeu, Cornwall, plentifully. *Ray.* In loose sand near Exmouth, Devonshire. *Hudson.* Torbay. *Mr. C. S. Cullen.*

Annual. *July—September.*

A smooth, slightly succulent, herb, of a lurid glaucous hue, more or less tinged with purple. *Root* fibrous, deeply fixed in the sand; simple at the crown. *Stems* many, a span long, spreading every way flat on the ground, much branched in a forked manner. *Leaves* opposite, on short stalks, obtuse, very unequal at the base; sometimes finely toothed there and at the extre-

mity. *Fl.* small, solitary, on short stalks, from the forks of the stem, coloured like the herbage. *Nect.* 4, rounded, reddish. *Caps.* and *seeds* large, smooth, deciduous when ripe.

Authors unanimously take this for the *πεπλῖς*, *Peplis*, of Dioscorides. It agrees with his description, and was found by Dr. Sibthorp on all the shores of Greece, and the neighbouring islands. The herb, dried or salted, was preserved by the ancient Greeks as a powerful purge, like the *πεπλός* of the same writer, which Dr. Sibthorp, with great probability, referred to *Euphorbia falcata*.

** *Umbel of 3 branches.*

2. *E. Peplus*. Petty Spurge.

Umbel three-branched, forked. Bracteas ovate. Leaves obovate, stalked, entire. Nectaries crescent-shaped. Seeds dotted.

E. peplus. *Linn. Sp. Pl.* 653. *Willd. v. 2.* 903. *Fl. Br.* 514. *Engl. Bot. v. 14. t.* 959. *Curt. Lond. fasc. 1. t.* 35. *Hook. Scot.* 148. *Bull. Fr. t.* 79.

Tithymalus n. 1049. *Hall. Hist. v. 2.* 9.

T. parvus annuus, foliis subrotundis non crenatis, Peplus dietus. *Raii Syn.* 313.

Peplus. *Dod. Pempt.* 375. *f. Fuchs. Hist.* 603. *f. Ic.* 345. *f. Matth. Valgr. v. 2.* 598. *f. bad. Camer. Epit.* 969. *f. Dalech. Hist.* 1658. *f.*

P. sive Esula rotunda. *Bauh. Pin.* 292. *Ger. Em.* 503. *f. Lob. Ic.* 362. *f.*

Esula folio rotundo. *Riv. Tetrap. Irr. t.* 118.

A common weed, in all cultivated ground.

Annual. *July, August.*

Herb light green, smooth, erect, from 6 to 10 inches high, often with a branch or two at the base only. *Umbel* large, of 3 spreading, repeatedly forked branches, with a pair of opposite, ovate, or heart-shaped, acute, entire, sessile *bracteas* at each subdivision; and 3 obovate stalked ones under the common *umbel*. *Fl.* yellowish. *Nect.* 4, crescent-shaped, slender, acute. *Caps.* smooth. *Seeds* angular, marked with depressed dots.

The description which Dioscorides gives of his *πεπλός* might well be referred to this plant, by commentators unacquainted with *E. falcata*. Its qualities are like the preceding. The juice of this and *E. helioscopia*, more especially, is applied, to destroy warts; whence their common name Wart-weed, vulgarly corrupted to Rat-weed.

3. *E. exigua*. Dwarf Spurge.

Umbel three-branched, forked. Bracteas lanceolate. Leaves linear. Nectaries horned. Seeds wrinkled.

E. exigua. Linn. *Sp. Pl.* 654. Willd. *v.* 2. 903. *Fl. Br.* 515. *Engl. Bot.* *v.* 19. *t.* 1336. *Curt. Lond. fasc.* 4. *t.* 36. *Dicks. H. Sicc. fasc.* 9. 6. *Hook. Scot.* 148. *Fl. Dan.* *t.* 592.

Tithymalus n. 1048. *Hall. Hist.* *v.* 2. 9.

T. leptophyllos. *Raii Syn.* 313. *Camer. Epit.* 966. *f.*

T. exiguus saxatilis. *Bauh. Prodr.* 133. *Magnol. Monsp.* 259. *f.*

T. sive Esula exigua. *Bauh. Pin.* 291.

T. minimus angustifolius annuus. *Bauh. Hist.* *v.* 3. *p.* 2. 664. *f.*

Esula exigua. *Trag. Hist.* 296. *f.* *Ger. Em.* 503. *f.* *Lob. Ic.* 357. *f.*

E. minima Tragi. *Dalech. Hist.* 1656. *f.*; not *Peplis minor*, 1659.

In gravelly corn-fields.

Annual. *July*.

Our smallest *Euphorbia*, from 3 to 6 inches high, smooth, rather glaucous, erect, either branched or not from the bottom. *Leaves* very narrow, usually acute; but not unfrequently abrupt and somewhat wedge-shaped; when it becomes *E. retusa* of *Cavanilles, Ic. v. 1. t. 34. f. 3*, which the slightest observation or comparison may retrace to its original. *Umbel* sometimes of 4 or 5 branches. *Bracteas* unequal, and inclining to heart-shaped, at the base, always acute at the point. *Fl.* small; their *nectaries* tawny, rounded, with a pair of distinct, or superadded, horns. *Caps.* smooth. *Seeds* quadrangular, rugged.

Bauhin's Tithymalus n. 2, Prodr. 133, is the blunt-leaved variety. See *Magnol*.

*** *Umbel of 4 branches.*

4. *E. Lathyris*. Caper Spurge.

Umbel four-branched, forked. *Leaves* opposite, four-ranked, sessile, entire; heart-shaped at the base.

E. Lathyris. Linn. *Sp. Pl.* 655. Willd. *v.* 2. 506. *Bot. Guide* 27. *Engl. Bot.* *v.* 32. *t.* 2255. *Comp. ed.* 4. 148. *Bul. Fr. t.* 103.

Tithymalus n. 1044. *Hall. Hist.* *v.* 2. 7.

Lathyris. *Matth. Valgr. v.* 2. 597. *f.* *Camer. Epit.* 968. *f.* *Fuchs. Hist.* 455. *f.* *Ic.* 256. *f.* *Dalech. Hist.* 1657. *f.*

L. major. *Bauh. Pin.* 293.

L. seu Cataputia minor. *Ger. Em.* 503. *f.*

Esula major. *Riv. Tetrap. Irr. t.* 114.

Cataputia vulgaris. *Besl. Hort. Eyst. æstiv. ord.* 12. *t.* 2. *f.* 1.

In dry stony thickets, probably a naturalized plant.

In several places about Upton, near Reading, Berks, springing up periodically for a year or two after the bushes have been cut, and till choked by briars, &c. *Rev. Dr. Beeke, Dean of Bristol*. On the declivities of the Steep Holmes, in the Severn. *Dr. Gapper*.

Biennial. *June, July*.

Root with many strong fibres. *Stem* solitary, erect, 2 or 3 feet high, purplish, round, hollow, smooth like every other part.

Leaves numerous, spreading in 4 rows, opposite, sessile, oblong, acute, entire, of a dark glaucous green; their base heart-shaped; the lower ones gradually diminishing. *Umbel* solitary, terminal, large, of 4 repeatedly forked branches. *Bracteas* heart-shaped, entire, tapering to a point. *Fl.* sessile in each fork, solitary, variegated with yellow and dark purple. *Nect.* rounded, with blunt horns. *Caps.* large, smooth.

The half-ripe *capsules*, however acrid, are reported to be sometimes pickled, as a substitute for Capers; but the *Caltha*, v. 3. 59, is a better imitation as to outward appearance.

**** *Umbel of 5 branches.*

5. *E. portlandica*. Portland Spurge.

Umbel five-branched, forked. *Bracteas* slightly heart-shaped, concave. *Leaves* linear obovate pointed, smooth, spreading. *Nectaries* four. *Capsule* rough at the angles.

E. portlandica. *Linn. Sp. Pl.* 656. *Willd. v.* 2. 911. *Fl. Br.* 515. *Engl. Bot. v.* 7. 441. *Jacq. Hort. Schonbr. v.* 4. 44. *t.* 487.

Tithymalus maritimus minor, *Portlandicus*. *Dill. in Raii Syn.* 313. *t.* 24. *f.* 6.

On the sea coast, chiefly in the south.

On the narrow neck of land which joins Portland to Dorsetshire.

Rev. Mr. Stonestreet. Also on several parts of the coasts of Devonshire, Cornwall, and Wales. *Huds.* Upon the warren near Exmouth, plentifully. *Bishop of Carlisle.* Found by Mr. James Smith in Scotland, on the Gallway coast. *Mr. G. Don.* 1802.

Perennial. *August.*

Root long and slender, much branched, spreading widely. *Herb* glaucous, smooth. *Stems* about a foot high, ascending, leafy, round, becoming purplish in autumn. *Leaves* numerous, scattered, an inch long, varying in breadth, but of a more or less narrow obovate figure, obtuse with a small point, entire. *Umbel* of 5, repeatedly forked, branches, and attended by a few scattered branches besides, from the bosoms of the upper leaves. There are 5 leaves at the base of the umbel, like those of the stem. *Bracteas* rather rhomboid than heart-shaped, pointed. *Nect.* 4, broadly crescent-shaped. *Caps.* rough at the angles. *Seeds* copiously dotted, or reticulated.

The Greek plant referred to this species in *Prodr. Fl. Græc. v.* 1. 327, proves on a more accurate inspection, to differ in having broader *leaves*, smooth angles to the capsule, and larger *seeds*, which are neither dotted nor reticulated. Hence this new species has received the name of *leiosperma*, in *Fl. Græc. v.* 5. 51. *t.* 465. *Tithymalus* of Barrelier, *t.* 822, though quoted by Linnæus and Jacquin, and of course by Willdenow, is a mountain species, not

well answering in characters to our *portlandica*, which seems confined to the shores of Britain.

6. *E. paralia*. Sea Spurge.

Umbel about five-branched, forked. Bracteas heart-kidney-shaped. Leaves imbricated upwards, concave. Nectaries five. Capsule nearly smooth.

E. paralia. *Fl. Br.* 516. *Engl. Bot.* v. 3. t. 195.

E. Paralias. *Linn. Sp. Pl.* 657. *Willd.* v. 2. 912. *Jacq. Hort. Vind.* v. 2. 88. t. 188.

Tithymalus paralius. *Raii Syn.* 312. *Dod. Pempt.* 370. f. f. *Bauh. Hist.* v. 3. p. 2. 674. f. 675. *Ger. Em.* 498. f. *Matth. Valgr.* v. 2. 590. f. *Camer. Epit.* 962. f. *Dalech. Hist.* 1647. f. *Lob. Ic.* 354. f.

On the sandy sea coast in many places, but not very common.

Perennial. *August, September.*

Root woody and tough, sending up several flowering stems about a foot high; with others of humbler growth, clothed with leaves only. The whole herb is smooth and glaucous, whitish when dry. *Leaves* on all the stems very numerous, imbricated upwards, in several rows, elliptic-oblong, varying in breadth, sessile, concave, entire; convex at the back. *Umbel* of from 4 to 6 forked branches. *Bracteas* heart-shaped, or somewhat kidney-shaped. *Nect.* 5, of a roundish crescent-shape, with short points. *Caps.* externally roughish, or wrinkled. *Seeds* brown, smooth.

7. *E. helioscopia*. Sun Spurge. Common Wart-wort.

Umbel of five three-cleft, then forked, branches. Bracteas and leaves obovate, serrated. Nectaries four, undivided. Capsule smooth.

E. helioscopia. *Linn. Sp. Pl.* 658. *Willd.* v. 2. 914. *Fl. Br.* 516. *Engl. Bot.* v. 13. t. 883. *Curt. Lond. fasc.* 1. t. 36. *Hook. Scot.* 148. *Ehrh. Pl. Off.* 345.

Tithymalus n. 1050. *Hall. Hist.* v. 2. 10.

T. helioscopius. *Raii Syn.* 313. *Matth. Valgr.* v. 2. 591. f. not good. *Camer. Epit.* 963. f. *Fuchs. Hist.* 811. f. *Ic.* 468. f. *Ger. Em.* 498. f. *Dalech. Hist.* 1648. f. *Dod. Pempt.* 371. f.

Esula vulgaris. *Trag. Hist.* 294. f.

A common weed in cultivated ground.

Annual. *July, August.*

Root tapering. *Herb* smooth, of a full grass green, abounding with milk, which is used by rustics to destroy warts, whence the name Wart-wort, usually corrupted into Rat-weed. Yet Haller says this juice is rather salt than acrid. On the con-

trary, Linnæus declares it to be corrosive and ulcerating, like *Cantharides*; and he further asserts in *Fl. Suec.* on the authority of a Dr. Hagström, that the plant, eaten by cattle, gives a disagreeable smell to meat. Sheep that feed upon it are attacked with diarrhoea. The *stem* is erect, a span high, or more, leafy, generally branched at the bottom, and terminated by a large green *umbel*, of 5 branches, each of which divides into 3 others which are forked; the whole copiously furnished with obovate serrated *bracteas*, of which the uppermost are rather heart-shaped. *Leaves* obovate, finely serrated, tapering at the base, or stalked. *Nect.* 4, roundish, entire, at first green, then turning yellow. *Caps.* smooth and even in every part.

8. *E. stricta*. Upright Warty Spurge.

Umbel of about five three-cleft, then forked, branches.

Leaves lanceolate, finely serrated. Nectaries four, rounded, entire. Capsule warty. Seeds smooth.

E. stricta. Linn. *Syst. Nat. ed.* 10. v. 2. 1049. *Fl. Græc.* v. 5. 53. t. 469.

E. platyphylla. Huds. 209. *Herb. D. Rose.* Fl. Br. 517, α . *Comp. ed.* 4. 148.

Tithymalus platyphyllos. Raii *Syn.* 312; *synonyms doubtful*.

β . *Euphorbia stricta*. Engl. Bot. v. 5. t. 333.

E. verrucosa. Huds. 209; *not of Linn.*

Tithymalus verrucosus. Raii *Syn.* 312? *not of Bauhin, nor of Dalechamp.*

In cornfields, but rare.

α . Wild in Mr. Ray's orchard at Black Notley, Essex. Raii *Syn.* Near Northfleet, Kent. Hudson.

β . In Essex, Mr. Dale; near York, Dr. Robinson. Ray. On the north side of Eversden wood, Cambridgeshire. Rev. Mr. Relhan. Gathered near Harefield, in 1793.

Annual. July, August.

Few British plants are involved in more confusion than this. Our first variety, only 12 or 18 inches high, has been confounded by Linnæus with his *E. platyphylla*, Jacq. *Austr.* t. 376, which is Haller's *Tithymalus n.* 1053, very abundant by road sides in Switzerland. This, in every part but the *flowers* and *fruit*, is so much larger than our's that they can hardly be supposed the same. However this may be, our's is precisely the Linnæan *stricta*, first described in the 10th edition of *Syst. Nat.* v. 2. 1049, though not in either edition of *Sp. Pl.* Our β is the same species in a starved condition. It is scarcely credible that Ray, or anybody, should have taken this for the large creeping-rooted *Tithymalus verrucosus* of J. Bauhin, v. 3. p. 2. 673, and Dr. Robinson's plant, found near York, requires therefore to

be investigated. The following description will identify our *E. stricta*.

Root small, tapering, zigzag, with several lateral fibres. *Whole herb* light green, somewhat tawny, not black, when dried, quite smooth, except a few occasional hairs on the rib of the *leaves*, or of the *bracteas*, at the back. *Stem* erect, from 6 to 12 or 15 inches high, straight, round, hollow, very smooth, copiously leafy in the upper part, often naked and purplish below. *Leaves* spreading, or deflexed, scattered, sessile, lanceolate approaching to obovate, acute, finely but unequally serrated; dilated in some degree at the base, so as to be heart-shaped, or auricled; the lowermost often slightly stalked. *Umbel* of 5 branches in strong plants; in weaker ones of only 3 or 4; each in 3 subdivisions, once or twice forked, when luxuriant; otherwise simply forked, or scarcely at all subdivided. Several *branches*, once or twice forked, spring from some of the uppermost leaves. There is often a solitary *flower* in the centre of the main *umbel*, whose branches are, as usual, accompanied by an equal number of ovate *bracteas*, all serrated like the partial ones above them, which are rather heart-shaped. *Nect.* 4, roundish, yellow, entire. *Germ.* granulated. *Caps.* covered with small obtuse warts, scarcely more prominent than those of the germen. *Seeds* somewhat lenticular, very smooth, of a brownish lead-colour.

In *Fl. Br.* the partial *bracteas* are said to be occasionally hairy all over, a mistake arising from some erroneous specimens. Several exotic species, allied to this, require elucidation. *E. verrucosa*, Linn. Mant. 2, 393, from the Levant, is very different from the original one, and might well be named *muricata*, in allusion to the prickly capsules.

***** *Umbel of 6 or more branches.*

9. *E. Esula*. Leafy-branched Spurge.

Umbel of numerous forked branches. *Bracteas* nearly heart-shaped. All the leaves uniform. *Nectaries* rhomboid with two horns. *Capsule* smooth.

E. Esula. Linn. Sp. Pl. 660. Willd. v. 2. 919. Fl. Br. 518. Engl. Bot. v. 20. t. 1399. Ehrh. Herb. 86. Hook. Scot. 148. See Lightf. 1135.

Tithymalus n. 1046. Hall. Hist. v. 2. 8. A doubtful Swiss plant.

T. pineus. Ger. Em. 499. f. Lob. Ic. 357. f.

T. Cyparissias. Fuchs. Hist. 812. f. Ic. 469. f.

Esula. Riv. Tetrap. Irr. t. 113.

E. minor. Dod. Pempt. 374. f. Dalech. Hist. 1653. f.

In shady woods, rare.

In a wood near a rivulet at Abercorn, 13 miles west of Edinburgh.

Mr. B. Charlesworth, and Mr. J. Mackay. In some other spots

a few miles from Edinburgh; Mr. Maughan. *Hooker*. At Slinfold, Sussex. *Mr. W. Borrer*.

Perennial. *July*.

Root creeping, woody. *Herb* smooth, light green, not glaucous. *Stems* 12 or 18 inches high, erect, round, solid, leafy, with several lateral axillary, leafy branches, destitute of flowers. *Leaves* of the branches, as well as of the main stem, numerous, scattered, on short stalks, linear, inclining to obovate, entire, all uniform. *Umbel* of 8 or 10 branches, which are once or twice forked, and there are similar ones from the bosoms of some of the upper leaves. *Bracteas* broadly heart-shaped, entire, with a small point. *Nect.* 4, of a tawny brown, rhomboid, with 2 lateral horns. *Germen* smooth. I have not seen the *capsule* or *seeds*, which perhaps are rarely perfected, the plant increasing much by root.

The cuts of Fuchsius surely represent this, and not the following.

10. *E. Cyparissias*. Cypress Spurge.

Umbel of numerous forked branches. *Bracteas* somewhat heart-shaped. *Stem-leaves* lanceolate; those of the lateral branches linear and very narrow. *Nectaries* lunated. *Capsule* nearly smooth.

E. Cyparissias. *Linn. Sp. Pl.* 661. *Willd. v. 2.* 920, *excl. var. β.* *Fl. Br.* 519. *Engl. Bot. v. 12, t.* 840. *With.* 451. *Winch Guide* 46. *Hook. Scot.* 148. *Jacq. Austr. t.* 435.

Tithymalus n. 1047. *Hall. Hist. v. 2.* 8.

T. Cyparissias. *Matth. Valgr. v. 2.* 592. *f.* *Dod. Pempt.* 371. *f.* *Dalech. Hist.* 1644. *f.* 1648. *f.* *Moris. v. 3.* 338. *sect. 10. t. 2.* *f.* 29.

T. cupressinus. *Ger. Em.* 499. *f.* *Lob. Ic.* 356. *f.*

In groves, thickets, and the barren borders of fields.

In the Earl of Stamford's woods, at Enville, Staffordshire. *Withering*. Barton Leat wood, Bedfordshire. *Rev. Dr. Abbot*. Near Alnwick, Northumberland. *Mr. Winch*.

Perennial. *June, July*.

Root woody, creeping extensively, but not rapidly. *Herb* smooth, smaller in its *leaves*, *bracteas* and *flowers* than the preceding, from which it differs strikingly in the greater abundance, very narrow shape, and more glaucous colour of the *leaves* of its lateral branches, which though they generally bear no flowers, often rise above the central *umbel* in great numbers. The *branches* of the *umbel* are from 10 to 15, twice forked. *Bracteas* pointless, assuming a beautiful scarlet hue after the flowers are past. *Nect.* 4, yellow, crescent-shaped, correctly distinguished in *Engl. Bot.* from those of *E. Esula*. *Caps.* mostly smooth and even, but not unfrequently warty in an early state. Haller notices the *nectaries* of this and the last, which he consi-

ders as affording good distinctive marks of the two species. Yet he misquotes Rivinus and Fuchsius. C. Bauhin likewise appears to confound these *Euphorbiæ* under his *Tithymalus cyparissias*, Pin. 291. n. 1 and 2; but there are few species more distinct.

11. *E. hiberna*. Irish Spurge. Makinboy.

Umbel of six forked branches. Bracteas ovate. Leaves obtuse. Stem simple. Nectaries kidney-shaped, pointless. Capsule warty, erect.

E. hyberna. Linn. Sp. Pl. 662. Willd. v. 2. 923. Fl. Br. 519.

Engl. Bot. v. 19. t. 1337. Dicks. H. Sicc. fasc. 18. 14.

Tithymalus hibernicus. How Phyt. 121. Raii Syn. 312.

T. hibernicus, vasculis muricatis erectis. Dill. Elth. 387. t. 290.

T. platyphyllos. Clus. Hist. v. 2. 190. f. Dod. Pempt. 372. f. Ger. Em. 500. f. Dalech. Hist. 1649. f.

T. latifolius hispanicus. Bauh. Pin. 291.

Plataphyllum hispanicum. Lob. Ic. 361. f.

Broad Spurge. Petiv. H. Brit. t. 53. f. 7.

In fields, thickets and woods.

In Ireland, Ray. Common in the county of Kerry. Dr. Wade. Near Belfast. Mr. Templeton. About the lake of Killarney, also in other parts of Kerry, as well as in Cork. Rev. T. Butt. Among the corn near Twickenham Park, against Richmond, and near Otterspool; Mr. Doody. Dill. but this appears, by the *Hortus Elthamensis*, to have proved a mistake. Mr. Hudson nevertheless found it between Feversham, and Sittingbourn in Kent.

Perennial. June.

Root tapering. Whole plant nearly smooth, deep green, abounding with very acrid milk. Stem nearly 2 feet high, erect, round, solid, leafy, destitute of lateral branches, except now and then from the bottom. Leaves scattered, sessile, numerous, 2 or 3 inches long and one broad, entire, more or less obtuse, and often regularly obovate, as in the old wooden cuts; the youngest having hairy midribs. Umbel large, almost constantly of 6 rays, which reach but little beyond the large, elliptic-oblong general bracteas. The partial bracteas are ovate and much smaller, often yellowish, their ribs smooth. Nect. 4, broad and short, inversely kidney-shaped, entire, pointless, of a tawny, or brown-purplish, colour, with large, intermediate, upright, pale, rounded scales. Barren fl. numerous, the joint of the filament with its stalk very evident. Fertile fl. as well as the fruit always erect, which Dillenius justly notices, as very peculiar in this genus. Germen and capsule covered with very prominent warts. Seeds roundish, smooth.

12. *E. amygdaloides*. Wood Spurge.

Umbel of about six forked branches; with numerous axillary stalks beneath. Bractees rounded, perfoliate. Leaves obtuse, hairy. Capsule smooth.

E. amygdaloides. Linn. *Sp. Pl.* 662. *Am. Acad.* v. 3. 126. Willd. v. 2. 924. *Fl. Br.* 520. *Engl. Bot.* v. 4. t. 256.

E. sylvatica. Linn. *Sp. Pl. ed.* 1. 463. *Am. Acad.* v. 3. 126. Jacq. *Austr. t.* 375. *Bull. Fr. t.* 95.

Tithymalus n. 1045. *Hall. Hist.* v. 2. 8.

T. characias amygdaloides. *Bauh. Pin.* 290. *Raii Syn.* 312. *Ger. Em.* 500. f.

T. characias primus. *Dod. Pempt.* 368. f. *Dalech. Hist.* 1646. f.

T. sylvaticus, toto anno folia retinens. *Bauh. Hist.* v. 3. p. 2. 671. f.

T. lunato flore. *Column. Ecphr.* v. 2. 56. t. 57.

Characias amygdaloides. *Lob. Ic.* 360. f.

In woods, groves, and thickets, common.

Perennial. *March, April.*

Root branching, knotty, somewhat woody. *Herb* milky, soft and downy. *Stems* several, rather shrubby, biennial, simple, leafy, round; purple in the lower part when stripped of its leaves; many-flowered above. *Leaves* scattered, numerous, spreading, stalked, entire, oblong or obovate, obtuse. *Umbel* usually of 5 or 6 simply forked branches, accompanied beneath by numerous similar branches, solitary from the bosoms of the paler, or purplish, more remote, upper leaves. *Bractees* yellowish, pale, combined, rounded, pointless, nearly or quite smooth. *Nect.* 4, crescent-shaped, acute, yellow. *Caps.* elliptical, smooth.

Sometimes each *bractea* has a minute point. On this Linnæus founded the character of his original *E. sylvatica*, which however is a very trivial variety. What he afterwards took for *sylvatica* is *segetalis*. For ascertaining this I am obliged to my friend Prof. DeCandolle, and at his persuasion I do not scruple to unite *amygdaloides* and *sylvatica*, whose descriptions and figures are generally much confounded by authors. Haller went far enough to discover this; but declined pursuing the investigation of numerous species, not natives of either Switzerland or Britain, involved in the confusion.

13. *E. Characias*. Red Shrubby Spurge.

Umbel of numerous forked downy branches; with many axillary crowded stalks beneath. Bractees somewhat pointed, perfoliate. Leaves lanceolate, downy. Capsule hairy.

E. Characias. Linn. *Sp. Pl.* 662. Willd. v. 2. 925. *Fl. Br.* 521. *Engl. Bot.* v. 7. t. 442. Jacq. *Ic. Rar.* t. 89. *Coll.* v. 1. 57.

MONOECIA—MONANDRIA. Zannichellia. 69

Tithymalus Characias. *Matth. Valgr. v. 2. 588. f. Camer. Epit. 960. f.*

Clus. Hist. v. 2. 188. f. Dalech. Hist. 1642. f.

T. Characias rubens peregrinus. *Bauh. Pin. 290.*

T. Characias Monspeliensium. *Raii Syn. 312. Ger. Em. 499. f.*

T. Characias secundus. *Dod. Pempt. 368. f.*

T. amygdaloides sive Characias. *Bauh. Hist. v. 3. p. 2. 672. f.*

Characias Monspeliensis. *Lob. Ic. 359. f.*

Esula caule crasso. *Riv. Tetrap. Irr. t. 115.*

In bushy mountainous places, rare.

In the forest of Needwood, Staffordshire, very plentifully, undoubtedly wild. *Mr. Whately.*

Shrub. *March, April.*

Stems shrubby, perennial, three feet high, or more, downy, very milky, purplish brown, hollow, simple; leafy in the upper part.

Leaves numerous, evergreen, crowded, on winged stalks, spreading every way, lanceolate, acute, entire, dark green, paler beneath, downy and soft to the touch, though rather more coriaceous than the last; the upper ones gradually shorter and broader.

Umbel large, of 12 or 15 downy stiff branches; besides many axillary ones from the uppermost leaves; each once or twice forked. *Bractes* of a lighter green, downy, broadly heart-shaped, partly pointed; combined at the base. *Nect.* 4, crescent-shaped, obtuse, dark purple. *Caps.* drooping, of 3 tumid hairy lobes.

The scent of the *flowers* is powerfully fetid, and disagreeable, though the aspect of the plant is not unhandsome. It is evidently distinct from the last, and from numerous foreign shrubby species, which approach it in general habit, but whose *nectaries* are mostly yellow, or reddish, and their *leaves* smooth.

424. ZANNICHELLIA. Horned-pondweed.

Linn. Gen. 476. Juss. 19. Fl. Br. 955. Mich. Gen. 70. t. 34. Lam. t. 741. Gærtn. t. 19.

Graminifolia. *Dill. Giss. suppl. 168.*

Nat. Ord. Inundatæ. Linn. 15. Naiades. Juss. 6. Fluviales. Hook. Scot. p. 2. 193.

Barren fl. *Cal.* none. *Cor.* none. *Filam.* solitary, sessile, simple, erect, taller than the *fert. fl.* *Anth.* ovate-oblong, erect of 2 or 4 parallel cells.

Fert. fl. solitary, by the side of the *barr. fl.* *Cal.* of 1 small, tumid, cloven leaf, inferior. *Cor.* none. *Germ.* 4 or 5, rarely more, stalked, oblong, obtuse, incurved. *Style* 1 to each germen, terminal, simple, erect, shorter than the germen. *Stigm.* solitary, spreading, peltate, ovate, dilated, entire, or toothed. *Caps.* stalked, oblong, incurved, some-

what compressed, of 1 cell and 1 valve, not bursting; tumid and rugged at the outer edge; tipped with the permanent style. *Seed* solitary, of the form of the cell, monocotyledonous, with a very thin, simple, membranous skin. *Embryo* central, tapering, incurved. *Albumen* none.

Slender, branched, floating *herbs*; submersed, except when in flower. *Leaves* simple, alternate, or partly opposite, linear, entire. *Fl.* axillary, in pairs.

1. *Z. palustris*. Common Horned-pondweed.

Anther of four cells. Stigmas entire.

Z. palustris. Linn. *Sp. Pl.* 1375. Willd. v. 4. 181. *Fl. Br.* 955. *Engl. Bot.* v. 26. t. 1844. Hook. *Scot.* 258. Mill. *Illustr.* t. 77. *Fl. Dan.* t. 67.

Z. n. 1604. Hall. *Hist.* v. 2. 279.

Z. palustris major, foliis gramineis acutis, flore cum apice quadricapsulari, embryonis clypeolis integris, et vasculo non barbato, capsulis seminum ad costam dentatis. Mich. *Gen.* 71. t. 34. f. 1.

Aponogeton aquaticum graminifolium, staminibus singularibus. Ponted. *Anthol.* 117. Raii *Syn.* 135.

Potamogeton capillaceum, capitulis ad alas trifidis. Bauh. *Pin.* 193. *Prodr.* 101.

Potamogeton similis, graminifolia ramosa, et ad genicula polyce-ratos. Pluk. *Almag.* 305. Phyt. t. 102. f. 7.

Horned Pondweed. Petiv. *H. Brit.* t. 6. f. 2.

In ponds and ditches.

Annual. July.

Root of several very slender fibres. *Herb* smooth. *Stem* thread-shaped, much branched, leafy, 12 or 18 inches long, floating. *Leaves* very narrow, acute, generally opposite under the *flowers*. *Bractea* axillary, solitary, tubular, membranous, oblique; including one barren *flower*, consisting of a simple *stamen*; and a fertile one on a short stalk. *Anth.* oblong, with 4 furrows and as many cells. *Germens* 4 or 5, their *stigmas* ovate, spreading, quite entire at the edges. *Caps.* tubercular, or rugged, at the outer edge.

Z. dentata of Willdenow, separated by him at my suggestion from our British plant, was long ago well distinguished by Micheli, t. 34. f. 2; and if he be correct as to the 2 cells of its *anther*, and the toothed *stigmas*, nothing can be more distinct. It may probably be found in England.

MONOECIA TRIANDRIA.

425. TYPHA. Cat's-tail, or Reed-mace.

Linn. Gen. 479. *Juss.* 25. *Fl. Br.* 959. *Tourn. t.* 301. *Lam. t.* 748. *Gærtn. t.* 2.

Nat. Ord. *Calamariæ*. *Linn.* 3. *Piperitæ*. *Linn. Ms.* *Typhae*. *Juss.* 8. *Aroideæ*. *Br. Prodr.* 338. *N.* 426 the same.

Barr. fl. numerous, in a dense, soft, cylindrical, terminal *catkin*, whose common *receptacle* is hairy or scaly. *Cal.* none. *Cor.* none. *Anth.* 3, more or less, drooping, oblong, obtuse, furrowed, on one common *filament*.

Fert. fl. numerous, in the lower part, continuous or interrupted, of the same *catkin*. *Cal.* none. *Cor.* none. *Germ.* superior, stalked, elliptic-oblong. *Style* capillary. *Stigma* simple. *Seed* solitary, ovate, crowned with the style, and beset with several capillary bristles, attached to the base of its stalk.

Creeping-rooted, aquatic, upright *herbs*, with wand-like, cylindrical, simple *stems*, leafy at the bottom only. *Leaves* linear, erect, long, narrow, entire, smooth. *Catkin* terminal, erect. *Anth.* yellow, deciduous. *Fert. fl.* brown. Perhaps this genus ought to be referred to *Monoccia Monadelphica*.

1. *T. latifolia*. Great Cat's-tail or Reed-mace.

Leaves somewhat convex beneath. Catkin continuous. Receptacle hairy.

T. latifolia. *Linn. Sp. Pl.* 1377. *Willd. v.* 4. 197. *Fl. Br.* 959. *Engl. Bot. v.* 21. *t.* 1455. *Hook. Scot.* 259. *Leers* 207. *Fl. Dan. t.* 645.

T. major. *Curt. Lond. fasc.* 3. *t.* 61.

T. n. 1305. *Hall. Hist. v.* 2. 163.

Typha. *Raii Syn.* 436. *Fuchs. Hist.* 823. *f.* *Ger. Em.* 46. *f.* *Lob. Ic.* 81. *f.* *Matth. Valgr. v.* 2. 216. *f.* *Camer. Epit.* 607. *f.*

T. aquatica. *Trag. Hist.* 681. *f.* *Dalech. Hist.* 994. *f.*

T. palustris major. *Bauh. Pin.* 20. *Theatr.* 337. *f.* *Bauh. Hist. v.* 2. 539. *f.* *Moris. v.* 3. 246. *sect.* 8. *t.* 13. *f.* 1.

Juncus asper Dodonæi. *Dalech. Hist.* 989. *f.*

In ponds, ditches, and slow streams, often among reeds.

Perennial. *July.*

Root stout, creeping, furnished with many thick hairy fibres. *Herb* smooth. *Stems* about 6 feet high, erect, round, solid, perfectly straight and simple, without joint or knot, leafy at the very bottom only. *Leaves* several, upright, almost as tall as the stems, linear, entire, tapering to a bluntish point; rather convex at the back; slightly concave in front; their bases sheathing, with a blunt membranous edge; the outer ones short and abortive. *Catkin* terminal, erect, about a foot long, uninterrupted; the *barren* part longest and thickest while in blossom, and furnished with a few scattered lanceolate scales. After the yellow *stamens* have fallen, the *fertile* part swells, becomes of a dark brown, and an inch thick, resembling coarse plush, finally dissolving into a mass of innumerable minute *seeds*, each winged underneath with fine hairs, and carried away by the wind. Haller says this downy substance serves to stuff pillows.

2. *T. angustifolia*. Lesser Cat's-tail or Reed-mace.

Leaves slightly semicylindrical; channelled above. Barren catkin separated from the fertile one. Receptacle scaly.

T. angustifolia. Linn. *Sp. Pl.* 1377. Willd. *v.* 4. 198. *Fl. Br.* 959.

Engl. Bot. *v.* 21. *t.* 1456. Hook. *Scot.* 259. *Fl. Dan.* *t.* 815.

T. minor. Curt. *Lond. fasc.* 3. *t.* 62.

T. n. 1306. Hall. *Hist.* *v.* 2. 163.

T. palustris media. Raii *Syn.* 436. Bauh. *Hist.* *v.* 2. 540. Moris. *v.* 3. 246. *sect.* 8. *t.* 13. *f.* 2.

T. palustris clavâ gracili. Bauh. *Pin.* 20. *Theatr.* 340. *f.*

In pools and ditches, less frequent than the foregoing.

About the middle of Woolwich Common. Curtis. In clay-pits near Bungay. Mr. Woodward. Between Norwich and Hingham, and in some other parts of Norfolk, Suffolk, and Essex.

Perennial. June, July.

Like the *T. latifolia* in general habit, but much more slender.

Leaves not half so broad, but more concave; semicylindrical in their lower part. There is a smooth naked portion of the stem, from $\frac{1}{2}$ an inch to an inch, between the barren and fertile catkins, and the common receptacle of both is rather scaly, or tuberculated, than hairy.

The Rev. Revett Sheppard found, in the marshes of Great Oakley, Essex, what seems a variety of this species, growing among the *latifolia*, having much thicker fertile catkins than such as grew in the neighbourhood of Little Oakley unaccompanied by the *latifolia*. The receptacle in these specimens however agrees with *angustifolia*, and there is a naked space above the fertile catkin. Mr. Sheppard suspected the pollen of the neighbouring large species might have affected these catkins, or it may perhaps be conjectured that they were the produce of mule plants,

originating from former impregnation. The *fertile catkins* of *T. angustifolia* sometimes split longitudinally in growing. See *Engl. Bot.*

3. *T. minor*. Dwarf Cat's-tail or Reed-mace.

Leaves linear, convex beneath. Catkins a little distant; barren one leafy; fertile short and turgid; often interrupted. Anthers nearly solitary. Receptacle naked.

T. minor. *Fl. Br.* 960. *Engl. Bot.* v. 21. t. 1457. *Willd. Sp. Pl.* v. 4. 197. *Bauh. Hist.* v. 2. 540. f. *Dalech. Hist.* 995. f. *Lob. Ic.* 81. f.

T. minima. *Willd. Sp. Pl.* v. 4. 197.

T. angustifolia β. *Linn. Sp. Pl.* 1378. *Huds.* 400.

T. n. 1306 β. *Hall. Hist.* v. 2. 163.

T. palustris minor. *Bauh. Pin.* 20. *Theatr.* 341. f. *Dill. in Raii Syn.* 436.

T. minima, duplici clavâ. *Moris.* v. 3. 246. sect. 8. t. 13. f. 3.

In marshes, but rare.

Found by Mr. Dandridge on Hounslow Heath. *Dillenius*.

Perennial. *July*.

Much smaller than either of the preceding. *Stem* very slender, about a foot, or foot and half, high. *Leaves* about a line in breadth; channelled above; convex beneath; as tall as the stem; pale and blunt at the point, being rather more tumid in that part than the other species. They are accompanied by numerous broad sheathing scales, the innermost of which are half as tall as the stems, and have been taken for leaves. Willdenow not having seen a remark to this effect in *Engl. Bot.* has been led to make two species out of one. The *barren catkin* often bears a membranous leaf, or scale, at the base, or at the summit. The *anthers* are short and thick, mostly solitary on each *filament*. *Recept.* apparently naked. *Fert. catkin* short and thick, becoming tumid, and oval, as it ripens, frequently interrupted about the middle; its upper half is sometimes continuous with the barren catkin. *Seed* with numerous bristles at the base of its stalk. I have seen no English specimen of this very distinct species; but the older writers could not possibly mistake it, nor would Linnæus, had he ever examined the plants, have confounded it with the last.

426. SPARGANIUM. Bur-reed.

Linn. Gen. 480. *Juss.* 26. *Fl. Br.* 961. *Tourn. t.* 302. *Lam. t.* 748. *Gærtn. t.* 19.

Nat. Ord. see n. 425.

Barr. fl numerous, aggregate, in one, or more, dense, su-

perior balls. *Cal.* of 3, or more, oblong, obtuse, equal, deciduous leaves. *Cor.* none. *Filam.* 3, capillary, erect, longer than the calyx. *Anth.* roundish, of 2 cells.

Fert. fl. numerous, in similar balls, beneath the former.

Cal. as in the barren fl. *Cor.* none. *Germ.* superior, ovate. *Style*, short, terminal. *Stigma* awl-shaped, or ovate, oblique, downy at one side, mostly solitary, rarely 2, permanent. *Drupa* obovate, beaked, dry, of 1, rarely 2, cells. *Nut* solitary, ovate. *Embryo* cylindrical, straight, in the centre of a mealy *albumen*. *Common recept.* globose, naked.

Creeping-rooted, aquatic, juicy, smooth, upright or floating *herbs*. *Stem* round, solid, leafy; in some species branched at the top. *Leaves* alternate, simple, linear, flat, entire, pliant. Balls of *flowers* alternate, on a common stalk. *Anth.* whitish. *Germ.* green.

1. *S. ramosum*. Branched Bur-reed.

Leaves triangular at the base, with concave sides. Common flower-stalk branched. *Stigma* linear.

S. ramosum. *Huds.* 401. *Fl. Br.* 961. *Engl. Bot.* v. 11. t. 744. *Willd. Sp. Pl.* v. 4. 199. *Curt. Lond. fasc.* 5. t. 66. *Hook. Scot.* 260. *Raii Syn.* 437. *Bauh. Pin.* 15. *Theatr.* 228. f. *Ger. Em.* 45. f. *Moris.* v. 3. 247. sect. 8. t. 13. f. 1. *Ehrh. Calam.* 138.

S. erectum. *Linn. Sp. Pl.* 1378. *Leers* 207. t. 13. f. 11.

S. n. 1303. α . *Hall. Hist.* v. 2. 162.

Sparganium. *Matth. Valgr.* v. 2. 339. f. *Camer. Epit.* 732. f. *Lob. Ic.* 80. f.

S. quibusdam. *Bauh. Hist.* v. 2. 541. f.

Phleos foemina. *Dalech. Hist.* 1017. f.

In ditches, and the margins of ponds and rivers, common.

Perennial. *July, August.*

Stem upright, about 3 feet high, very vascular, terminating in several alternate flower-branches, the lower ones accompanied by short clasping leaves. *Radical leaves* triangular at the base, the spaces between their angles somewhat concave, not flat; sword-shaped, erect, and elongated in their upper part, ending rather obtusely. Balls of *flowers* alternate, sessile; the barren ones white, above the rest, and most numerous. *Calyx-leaves* spatulate, brown. *Style* short. *Stigma* long, oblique, downy at one side, mostly solitary. *Drupa* with rarely more than one seed.

The herbage serves for package, along with similar coarse grassy plants, and is softer and more pliant than most of them, not cutting the hands by any sharp edges, like *Carices* or *Fern*.

2. *S. simplex*. Unbranched Upright Bur-reed.

Leaves triangular at the base, with flat sides. Common flower-stalk simple. Stigma linear.

S. simplex. Huds. 401. *Fl. Br.* 962. *Engl. Bot. v.* 11. *t.* 745. Willd. *Sp. Pl. v.* 4. 199. *Curt. Lond. fasc.* 5. *t.* 67. Hook. *Scot.* 260. Dicks. *H. Sicc. fasc.* 6. 7.

S. superaxillare. Ehrh. *Calam.* 129.

S. erectum β . Linn. *Sp. Pl.* 1378.

S. n. 345.* Linn. *Fl. Lapp. ed.* 1. 271. *ed.* 2. 280. *Herb. Linn.*

S. n. 1303 β . Hall. *Hist. v.* 2. 162.

S. non ramosum. Raii *Syn.* 437. Bauh. *Pin.* 15. *Theatr.* 231. *f. Moris. v.* 3. 245. *sect.* 8. *t.* 13. *f.* 3.

S. alterum. Lob. *Ic.* 80. *f.* Dalech. *Hist.* 1019. *f.* Bauh. *Hist. v.* 2. 541. *f.*

S. latifolium. Ger. *Em.* 45. *f.*

Sparganium. Tillands. *Ic.* 15. *f.*

In pools and ditches, especially on a gravelly soil.

Perennial. *July, August.*

Linnaeus, Haller and Leers have considered this as a variety of the preceding, but Hudson, Curtis, Ehrhart and succeeding botanists have well distinguished them. The present is a smaller plant. The intermediate spaces, between the 3 angles, at the base of each radical leaf, is flat, not concave, as Curtis, I believe, first remarked. The stem is erect, perfectly simple, not branched or paniced, the lowermost head of flowers only being usually elevated on a partial stalk. Calyx green, or not of so deep a brown as in the former. Anthers rather yellower. Stigma long and linear, for the most part solitary.

3. *S. natans*. Floating Bur-reed.

Leaves floating, flat; concave at the base. Common flower-stalk simple. Stigma ovate, very short. Ball of barren flowers mostly solitary.

S. natans. Linn. *Sp. Pl.* 1378. Willd. *v.* 4. 200. *Fl. Br.* 962. *Engl. Bot. v.* 4. *t.* 273. Hook. *Scot.* 260. *Fl. Dan. t.* 260. Dicks. *H. Sicc. fasc.* 6. 8. Ehrh. *Calam.* 110.

S. simplex β . Huds. 401.

S. n. 1304. Hall. *Hist. v.* 2. 163.

S. minimum. Raii *Syn.* 437. Bauh. *Pin.* 15? *Prodr.* 24?

In muddy fens, or slow rivers.

In the Norwich river. Mr. Rose. Ponds in Scotland. Dickson. Common in the lakes about Lochmaben, Dumfriesshire. Mr. J. Burgess, 1782. In Burwell fens, Cambridgeshire. Rev. Mr. Hemsted. Near Manchester. Dr. Hull.

Perennial. *July.*

Herb floating, about half the size of the last, of a pale transparent green, with nearly flat, or slightly channelled, *leaves*, not triangular at the base. *Globules* of fertile *flowers* 2 or 3, alternate, the lowermost stalked; the barren one terminal, mostly solitary. *Cal.* pale green. *Stigma* solitary, very short, ovate, peltate, oblique, on a short thick *style*. *Seed* solitary.

The form of the *stigma* clearly distinguishes this species.

427. CAREX. Carex, or Sedge.

Linn. Gen. 482. *Juss.* 26. *Fl. Br.* 963. *Br. Pr.* 241. *Dill. Gen.* 165. *t.* 14. *Mich. Gen.* 66. *t.* 33. *Lam. t.* 752. *Gærtn. t.* 2. *Cyperoides.* *Tourn. t.* 300. *Mich. Gen.* 55. *t.* 32.

Nat. Ord. Calamariæ. *Linn.* 3. *Cyperoidæ.* *Juss.* 9. *Cyperaceæ.* *DeCand.* 134. *Br. Pr.* 212.

Barr. fl. numerous, aggregate, in one or more, oblong, dense *catkins*, their *scales* imbricated every way. *Cal.* a single, lanceolate, undivided, permanent *scale* to each floret. *Cor.* none. *Filam.* 3, rarely fewer, capillary, erect or drooping, longer than the scales. *Anth.* vertical, long, linear, of 2 cells.

Fert. fl. numerous, in the same, or more usually in a different *catkin*, very rarely on a separate plant. *Cal.* as in the barren fl. *Cor.* a single, hollow, compressed, ribbed, often angular, permanent *glume* to each floret; contracted, mostly cloven, and often elongated at the extremity. *Germ.* superior, roundish, with 3, rarely but 2, angles, very smooth. *Style* 1, terminal, cylindrical, short. *Stigm.* 3, more rarely 2 only, awl-shaped, long, tapering, downy, deciduous. *Seed* the shape of the *germen*, with unequal angles, loosely coated with the enlarged, either hardened or membranous, permanent *corolla*, both together constituting the fruit.

A very extensive genus of the true *Calamariæ*, distinguished from all the rest, as from every one of the *Gramina*, see *v.* 1. 49 and 71, by the presence of a single-valved, tumid, finally enlarged or hardened, *glume*, loosely investing the *seed*, about the proper denomination of which botanists are not well agreed. I have hitherto called it a *tunic* (*arillus*) as apparently belonging to the *seed*; for an *arillus* may exist without a *seed-vessel*. But Mr. Brown's having met with it in some barren florets of *Carex acuta*, unaccompanied by any *pistil*, invalidates this opinion; see his *Prodr. v.* 1. 242; and I have now

termed it a *corolla*, which in this case is synonymous with his *perianth*. Linnæus called it a *nectary*, which is properly, in most cases, an appendage to the *corolla*. The part itself is easily recognised in the flower, and along with the *seed* constitutes the *fruit*, affording a most clear and certain generic character, as well as excellent distinctions of the species.

The *roots* in the genus *Carex* are, perhaps without exception, perennial, mostly creeping; sometimes fibrous and tufted only. *Herbage* grassy. *Stem* simple generally with three, finely serrated and sharply cutting, angles, without knots or joints. *Leaves* linear, pointed, flat, roughish, with similarly cutting edges; their bases more or less tubular and sheathing; membranous at the summit, often auricled; the upper ones becoming *bracteas*. *Stipulas* hardly any. *Catkins* one or more, variously disposed and constructed in the different species; solitary or aggregate, in a very few dioecious; generally monoecious. In several the barren and fertile florets occur in the same *catkin*, or in the same general *spike*. When aggregate the *catkins*, or *spikelets*, being separately bracteated, constitute a *spike*, rather than a *compound catkin*.

* *Catkin* solitary, simple.

1. *C. dioica*. Creeping Separate-headed *Carex*.

Catkins simple, dioecious. Fruit ovate, ribbed, ascending, finely serrated at the edges. Root creeping.

C. dioica. Linn. *Sp. Pl.* 1379. Willd. v. 4. 207. *Fl. Br.* 963. *Engl. Bot.* v. 8. t. 543. Gooden. *Tr. of L. Soc.* v. 2. 139. Hook. *Scot.* 260. *Fl. Dan.* t. 369. Schk. *Car.* t. A. f. 1. Ehrh. *Phytoph.* 6.

C. capitata. Huds. 402; Mr. E. Forster.

C. n. 1351. Hall. *Hist.* v. 2. 183.

Gramen cyperoides minimum, ranunculi capitulo rotundo. Dill. in *Raii Syn.* 425. *Moris.* v. 3. 245. n. 36. sect. 8. t. 12. f. 36.

Cyperoides parvum &c., n. 2. Mich. *Gen.* 56. t. 32. f. 2.

In spongy bogs, not uncommon.

Perennial. *May, June.*

A span high at most. *Root* and *herbage* slender, smooth. *Leaves* keeled. *Stipula* short, abrupt. *Catkins* linear, erect. *Scales* brown, with a green rib and white edges. *Anth.* whitish. *Stigm.* 2. Permanent *corolla* spreading nearly horizontally, ovate, ribbed at the outer side only, edged with fine serratures in the upper part, scarcely notched at the tip. *Seed* triangular.

There is now and then a fertile *floret* at the base of the barren *catkin*, or a few barren *florets* at the summit of the fertile one.

C. capitata, *Fl. Dan. t. 372. Schk. t. Y. f. 80*, is always monocious, and has a smooth-edged *corolla*; nor has it ever been found in Britain.

2. *C. Davalliana*. Prickly Separate-headed *Carex*.

Catkins simple, dioecious. Fruit lanceolate, triangular, ribbed, deflexed; its angles rough towards the summit. Root tufted.

C. Davalliana. *Sm. Tr. of L. Soc. v. 5. 266. Fl. Br. 964. Engl. Bot. v. 30. t. 2123. Willd. Sp. Pl. v. 4. 208. Hook. Scot. 260.*

C. dioica. *Huds. 401. E. Forster. Willd. Car. Berol. n. 16. Schk. Car. 6. t. A, Q, W. f. 2. "Host. Gram. v. 1. 32. t. 41."*

C. n. 1350. Hall. Hist. v. 2. 182; the synonyms confused.

Gramen cyperoides minus, ranunculi capitulo longiorc. Sherard in Raii Syn. ed. 2. 270. ed. 3. 425.

G. cyperoides spicâ simpliciei cassâ. Scheuchz. Agr. 497. t. 11. f. 9, 10; with the synonyms of C. pulicaris.

Cyperoides parvum, &c. n. 1. Mich. Gen. 56. t. 32. f. 1; not good.

In boggy mountainous situations, but rare, though very common in Switzerland.

In marshy ground in Mcarns-shire, North Britain. *Prof. James Beattie, jun.* In a bog near Crossgate-toll, and by the side of Guillon loch, Edinburgh; *Mr. Maughan. Hooker.* On Landsdown near Bath. *Mr. Groult, and Mr. E. Forster.* On spongy bogs in the county of Down, Ireland. *Sherard, the first observer of this species.* Near Belfast. *Mr. Templeton.*

Perennial. *May, June.*

Taller than the preceding; the root tufted, with strong zigzag fibres, not creeping. Stem sometimes very rough. Catkins twice the length of *C. dioica*, from which moreover the long-beaked, more or less reflexed, strongly ribbed *corolla*, rough-edged near the top, but not serrated as in that species, clearly distinguishes the present. The generally accurate Dr. Wahlenberg nevertheless unites them; an error almost as great as that relating to my *Eleocharis multicaulis*, v. 1. 64.

Mr. Sicber sent me specimens, from the alps of Carinthia, having several barren as well as fertile *florets*, in each *catkin*.

3. *C. pulicaris*. Flea *Carex*.

Catkin simple; florets in the upper half barren; in the lower fertile. Fruit spreading, deflexed, polished, tapering at each end. Stigmas two.

C. pulicaris. Linn. Sp. Pl. 1380. Willd. v. 4. 213. Fl. Br. 965. Engl. Bot. v. 15. t. 1051. Hook. Scot. 261. Lond. t. 177. Fl.

Dan. t. 166. *Lcers* 194. t. 14. f. 1. *Schk. Car.* 9. t. A. f. 3. *Ehrh. Phytoph.* 7.

C. Psyllophora. *Ehrh. in Linn. Suppl.* 413.

C. minima, caulibus et foliis capillaceis, capitulo singulari tenuiori, capsulis oblongis, utrinque acuminatis et deorsum reflexis. *Mich. Gen.* 66. t. 33. f. 1.

Gramen cyperoides minimum, seminibus deorsum reflexis puliciformibus. *Raii Syn. ed.* 2. 269. *ed.* 3. 424. *Pluk. Phyt.* t. 34. f. 10. *Moris. v.* 3. 244. *sect.* 8. t. 12. f. 21.

In spongy or muddy bogs, frequent.

Perennial. *Junc.*

Root tufted, of many slender, smooth, branched fibres. *Stems* from 6 to 12 inches high, slender, quadrangular, smooth, leafy at the base only. *Leaves* equally slender and smooth, triangular, not quite so tall; sheathing and ribbed at the base, with hardly any *stipula*. *Catkin* slender when in flower; subsequently its lower half becomes tumid, consisting of fertile *florets*, the upper of barren ones. *Scales* lanceolate, the lower ones forced off by the reflexed, triangular, brown, smooth and shining *fruit*; so that Willdenow, as often happens, has altered the specific character for the worse, few *Carices* having scales so deciduous. The *stamens* with us are certainly 3. *Stigmas* 2.

The original Linnæan name being latin, like the classical generic one, was most unadvisedly translated into Greek by Ehrhart; who being entrusted with the printing of the *Suppl. Plant.* abused that trust, by corrupting the text in this and many other instances, to the great displeasure of the younger Linnæus. He therefore ought not to be followed in any such alterations.

Dr. Wahlenberg informs us, in his *Fl. Lapp.* 224, that *C. pulicaris* is not found in Lapland, so that n. 339 of the Linnæan *Fl. Lapp.* must be either the following species, or *C. dioica*. I should, by the description, take it rather for the following, which Linnæus in his herbarium mistook for *pulicaris*.

4. *C. pauciflora.* Few-flowered Carex.

Catkin simple, lax, of few flowers; the uppermost barren. *Fruit* spreading, deflexed, awl-shaped, smooth. *Stigmas* three.

C. pauciflora. *Lightf.* 543. t. 6. f. 2. *Willd. Sp. Pl.* v. 4. 211. *Fl. Br.* 966. *Engl. Bot.* v. 29. t. 2041. *Winch Guide* v. 1. 83. *Hook. Scot.* 261. *Dicks. H. Sicc. fasc.* 1. 16. *Don. H. Br.* 68. *Schk. Car.* 10. t. A. f. 4. " *Host Gram. v.* 1. 33. t. 42."

C. patula. *Huds.* 402. and 657.

C. Leucoglochis. *Ehrh. in Linn. Suppl.* 413. *Phytoph.* 8. *Wahlenb. Lapp.* 224. *Fl. Dan.* t. 1279, not 1379.

In alpine bogs, but rare.

About half way up the mountain of Goat-fell, isle of Arran, in a

peat bog. *Lightf.* Near Glasgow. *Huds.* On wet moors in the Highlands. *Dicks.* On Ben Lomond. *Rev. Dr. Walker.* Ben Nevis. *Dr. Hooker and Mr. Borrer.* To the north of Blair, *Mr. Winch*; who found it also, for the first time in England, in a peat moss near the south-west end of Crag lake, Northumberland.

Perennial. *June.*

Root creeping, scaly with long fibres. *Herbage* smooth. *Stems* from 3 to 5 inches high, ascending, or erect, triangular, furrowed. *Leaves* 2 or 3, sheathing the base of the stem, narrow; channelled above. *Catkin* with one, rarely 2, terminal barren *florets*; and 2 or 3 fertile ones, reflexed as the seed ripens. *Stam.* 3. *Stigm.* 3. *Fruit* of a pale rusty yellow, awl-shaped, pointed, striated, rather longer than the *scales* of the *catkin*, which are usually broken off by its reflexed position, as in the last species.

** *Catkins* or *spikelets*, aggregate, each composed of barren and fertile *florets*. *Stigmas* two.

5. *C. stellulata*. Little Prickly *Carex*.

Spikelets three or four, roundish, slightly distant. Barren *florets* inferior. *Fruit* spreading, with a tapering undivided beak.

C. stellulata. *Gooden. Tr. of L. Soc. v. 2. 144. Fl. Br. 966. Engl. Bot. v. 12. t. 806. Hook. Scot. 263. Forst. Tonbr. 103. Willd. Sp. Pl. v. 4. 236. Schk. Car. 45. t. C. f. 14. Wahlenb. Lapp. 231; excluding the reference to Schreber.*

C. muricata. *Huds. 406. Lightf. 549. Leers 196. t. 14. f. 8. Fl. Dan. t. 284.*

C. echinata. *Sibth. 28. Ehrh. Calam. 68.*

C. n. 1366. Hall. Hist. v. 2. 187.

C. minor, radice fibrosâ, foliis angustioribus, caule exquisitè triangulari, spicâ sesquiunciali mutilatâ. Mich. Gen. 68. t. 33. f. 9.

Gramen cyperoides spicatum minimum, spicâ divulsâ aculeatâ. Raii Syn. 424. Scheuchz. Agr. 485. t. 11. f. 3.

G. nemorosum, spicis parvis asperis. Bauh. Pin. 7. Moris. v. 3. 244. sect. 8. t. 12. f. 26.

G. sylvaticum parvum tenuifolium, cum spicâ aculeatâ. Bauh. Hist. v. 2. 509. f. 510.

In boggy meadows, especially on a barren soil, common.

Perennial. *May, June.*

Root tufted, rather woody, with many strong fibres. *Herbage* of a grass green. *Stem* 6-12 inches high, triangular, its edges roughish. *Leaves* flat, sheathing the base of the stem; tapering and rough at the point. *Spike* erect, of 3 or 4 alternate, roundish *spikelets*, sometimes with a small *bractea* under the lowermost,

each consisting of a few barren *florets* in their lower part, and several fertile ones above. *Fruit* spreading, ovate, ribbed, brown, with a flat beak, which is green and rough at the edges, scarcely cloven at the extremity.

6. *C. curta*. White Carex.

Spikelets about six, elliptical, slightly distant, scarcely bracteated. Scales ovate, membranous, about as long as the ovate, tumid, smooth fruit.

C. curta. Gooden. *Tr. of L. Soc.* v. 2. 145. *Fl. Br.* 967. *Engl. Bot.* v. 20. t. 1386. *Hook. Scot.* 263. *Forst. Tonbr.* 103. *Willd. Sp. Pl.* v. 4. 241. *Car. Berol.* 19. t. 2. f. 3. “*Host. Gram.* v. 1. 37. t. 48.” *Schk. Car.* 43. t. C. f. 13. *Don. H. Br.* 194.

C. brizoides. *Huds.* 406.

C. canescens. *Lightf.* 550. *Fl. Dan.* t. 285. *Wahlenb. Lapp.* 232.

C. clongata. *Leers* 197. t. 14. f. 7.

C. tenella. *Ehrh. Calam.* 98.

C. n. 1360. *Hall. Hist.* v. 2. 185.

Gramen cyperoides palustre elegans, spicâ compositâ asperiore. *Raii Syn.* 423.

G. cyperoides elegans, spicâ compositâ molli. *Dill. in Raii Syn.* 423. *Pluk. Almag.* 178. *Phyt.* t. 34. f. 4. *Rel. Rudb.* 2. f. 34.

G. cyperoides, spicis curtis divulsis. *Læs. Pruss.* 117. t. 32.

In watery meadows, and about the borders of pools and ditches, rather uncommon.

In a pool at Middleton, Warwickshire, towards Colc's hill; also near Wrexham, Denbighshire, and in other places. *Ray*. In bogs in Isla, about two miles from the Sound; also in ditches by Loch Leven. *Herb. Lightf.* Common in marshy ground in Mearn's shire. *Prof. Beattie*. At Virginia water, Windsor forest. *Bishop of Carlisle*. Near Blundeston, Suffolk. *Mr. D. Turner*.

Perennial. *June*.

Root slightly creeping. *Stem* a foot high, with 3 angles rough in the upper part only. *Leaves* narrow, erect, taper-pointed, rough at the edges and keel, not quite so tall. *Spikelets* from 4 to 6, scarcely more, alternate, of a short, tumid, oval shape, and a pale silvery hue; the upper ones crowded; lowermost now and then accompanied by a slender *bractea*. A few of the lower *florets* barren; the rest fertile. *Scales* all ovate, membranous, acute, with a green rib not reaching to the point. *Fruit* broadly ovate, rather tumid, finely ribbed, not furrowed, smooth, with an undivided point. *Seed* exactly elliptical, flattened, tipped with the permanent *style*.

The neat, tumid, pale, silvery-white *spikelets* readily distinguish this *Carex*.

7. *C. elongata*. Elongated Carex.

Spikelets numerous, oblong, rather distant, without bracteas. Fruit ovate-oblong, tapering, cloven, many-ribbed, recurved, longer than the scales.

C. elongata. *Lim. Sp. Pl.* 1383 ; omitting the references to *Fl. Suec. Bauhin* and *Morison*. *Willd.* v. 4. 240 ; excluding the reference to *Leers*. *Schk. Car.* 49. t. E. f. 25. *Fl. Dau.* t. 1236.

C. multiculmis. *Ehrh. Calam.* 88.

C. n. 1359. *Hall. Hist.* v. 2. 185.

Cyperoides polystachyon, spicis laxis paniculam veluti componentibus. *Scheuchz. Agr.* 487. t. 11. f. 4.

In marshes, rare.

At Aldwark, near the river Don, below Sheffield, Yorkshire. *Mr. Jonathan Salt*. 1807.

Perennial. *June*.

Root tufted, of several stout fibres. *Herb* rather taller and larger than the last, with more numerous and less tumid *spikelets*, not white or silvery, but particoloured with green and a rusty hue. *Scales* ovate, glossy, brown, with a green rib, and dilated pale edges. *Fruit* near twice their length, strongly ribbed, greenish, ovate-lanceolate, tapering to a short, broad, cloven, spreading or recurved, rough-edged point. *Barren florets* few, in the lower part of each *spikelet*.

8. *C. ovalis*. Oval-spiked Carex.

Spikelets about six, oval, crowded, alternate, with a bractea under the lowermost. Fruit lanceolate, rough-edged, striated, nearly entire, the length of the lanceolate acute scales.

C. ovalis. *Gooden. Tr. of L. Soc.* v. 2. 148. *Fl. Br.* 968. *Prod. Fl. Græc.* v. 2. 227. *Engl. Bot.* v. 5. t. 306. *Hook. Scot.* 263. *Willd. Sp. Pl.* v. 4. 229. *Schk. Car.* 39. t. B. f. 8.

C. leporina. *Huds.* 404. *Lightf.* 547. *Leers* 195. t. 14. f. 6. *Ehrh. Phytoph.* 38. *Wahlenb. Lapp.* 228.

C. n. 1361. *Hall. Hist.* v. 2. 186.

Gramen cyperoides, spicâ e pluribus spicis brevibus mollibus compositâ. *Raii Syn.* ed. 2. 268. ed. 3. 422. *Scheuchz. Agr.* 456. t. 10. f. 15.

G. cyperoides palustre majus, spicâ divisâ. *Moris.* v. 3. 244. *sect.* 8. t. 12. f. 29.

In marshes and watery meadows.

Perennial. *June*.

Root creeping, scaly. *Stem* 12 or 18 inches high, hollow, with rough angles. *Leaves* deep green ; roughish at the edges and midrib ; sheathing at the base. *Spikelets* usually 5 or 6, rather crowded together, alternate, erect, elliptical, greyish, soft to the

touch, larger than in the foregoing, each accompanied at the base with an ovate scale, half its own length; the lower one generally with a bristle-shaped *bractea*, not rising so high as the common *spike*. *Florets* most of them fertile; a few of the lower ones, in each *spikelet*, barren. *Scales* lanceolate, or somewhat ovate, acute, about the length of the *corolla*, which is rough-edged, scarcely cloven at the summit, its surface becoming striated as the *seed* ripens.

The real *C. leporina*, certainly, by an original specimen, *n.* 322 of the Linnæan *Fl. Lapponica*, is an alpine species, but half the size of this, with 3 or 4 nearly globular *spikelets*, and an ovate smooth-edged *corolla*, longer than the *scales*. It is *C. Lachenalii* of Schkuhr, *t. Y. f.* 79. Linnæus undoubtedly confounded both together under *n.* 837, of *Fl. Suec. ed.* 2, where the description answers to the alpine plant; which therefore I cannot but consider as *C. leporina*, though very sorry to differ from Dr. Wahlenberg, who zealously contends for a contrary opinion, and calls my *leporina* by the name of *lagopina*. Willdenow, Schkuhr, and *Fl. Dan. t.* 294, agree with me; as did the late Mr. Davall, from a comparison of Swiss specimens with the Linnæan characters. The question is indeed a matter of fact rather than of opinion.

9. *C. tenella*. Slender-headed Carex.

Spikelets three, bracteated, distant, minute, of about three *florets*. Fruit elliptical, convex at each side, very smooth and even, with a blunt, entire beak. *Stamens* two.

C. tenella. Schk. *Car.* 23. *t. P.* p. *f.* 104, exclusive of *i, k, l.*

C. straminea. Don. *Cant. ed.* 5. 220.

In moist shady places, in Scotland.

In a wood by the river Esk, Angushshire, very rare. Mr. G. Don.

Root creeping, very slender, like the whole of the herbage, which is smooth, of a pale green. *Stems* a span high, erect, almost capillary. *Leaves* several, acute, sheathing the lower part of the stem, rather above half its height, and about twice its diameter in breadth. *Spike* erect, weak, of usually 3 rather distant, alternate, sessile, very small, round *spikelets*, each of 1 or 2 fertile *florets*, with ovate, membranous, pale *scales*, and 2 *stigmas*; and one terminal, barren *floret*, with a lanceolate *scale*, and only 2 *stamens*. Fruit elliptic-oblong, compressed, beaked, perfectly smooth all over, without any ribs or furrows, and equally convex at both sides; the *beak* nearly half as long as the seed, somewhat pyramidal, obtuse, entire. *Stigmas* 2.

Willdenow and Wahlenberg refer this plant of Schkuhr to *C. loliacea*, which differs essentially in having many-flowered *spikelets*, without *bracteas*, ribbed *fruit*, flat on one side, and I believe 3 *stamens*. It is Schkuhr's *gracilis*, 48. *t. F. f.* 24. That author appears to have drawn the ripe fruit of his *C. tenella*,

fig. i, k, l, from a starved specimen of *C. loliacea*. His *fig. h* is far more correct.

10. *C. remota*. Remote Carex.

Spikelets several, solitary, simple, remote, nearly sessile. Bracteas very long, overtopping the stem. Fruit ovate, with a slightly cloven beak.

C. remota. Linn. *Sp. Pl.* 1383. Willd. *v.* 4. 239. *Fl. Br.* 969. *Engl. Bot.* *v.* 12. *t.* 832. Hook. *Scot.* 263. *Fl. Dan.* *t.* 370. Leers 197. *t.* 15. *f.* 1. Rel. *Rudb.* 1. *f.* 27. Schk. *Car.* 46. *t.* E. *f.* 23. Ehrh. *Calam.* 58.

C. axillaris. Linn. *Sp. Pl.* 1382. Linn. *Ms.*

C. n. 1357. Hail. *Hist.* *v.* 2. 184.

C. angustifolia, caule triquetro, capitulis pulchellis, &c. Mich. *Gen.* 70. *n.* 2, 3. *t.* 33. *f.* 15, 16.

Gramen cyperoides angustifolium, spicis parvis sessilibus in foliorum alis. Raii *Syn.* 424. Pluk. *Almag.* 178. *Phyt.* *t.* 34. *f.* 3. Moris. *v.* 3. 243. *sect.* 8. *t.* 12. *f.* 17.

In moist shady places, by rivulets and ditches.

Perennial. May, June.

Root tufted, with stout smooth fibres. Herbage pale and slender. Stem about a foot high; leafy, smooth and roundish below; triangular and rough-edged in the upper part. Leaves narrow. Spikelets several, ovate, many-flowered, pale, yellowish; the lower ones solitary, and about 2 inches asunder, each accompanied by a very long, narrow, leafy bractea, whose bristly point rises above the stem; the upper ones smaller, crowded together, destitute of bracteas. Barren florets inferior, with 3 stamens. Fertile rather more numerous. Fruit ovate, ribbed, beaked; evidently, though not deeply, cloven at the extremity, rather longer than the scales.

11. *C. axillaris*. Axillary Clustered Carex.

Spikelets several, remote, sessile; the lower ones compound, with very long bracteas. Fruit ovate; its beak deeply cloven.

C. axillaris. Gooden. *Tr. of L. Soc.* *v.* 2. 151. *t.* 19. *f.* 1. *Fl. Br.* 970. *Engl. Bot.* *v.* 14. *t.* 993. Willd. *Sp. Pl.* *v.* 4. 239. Schk. *Car.* 47. *t.* R. *f.* 62.

In marshes, and the neighbourhood of wet ditches, on a strong soil. Near Putney. Mr. Curtis. At Earsham, Norfolk. Mr. Woodward. Found in Switzerland by the late Mr. Davall.

Perennial. June.

Nearly akin to the last, but larger, with broader leaves, and smaller bracteas, except the lower one. The bracteated spikelets are generally compound in their lower part. Beak of the fruit more

deeply cloven perhaps than that of *C. remota*, though this difference is not very striking. The *spikelets* are more turgid, and it may be suspected that Micheli had our present species in view at his *t. 33. f. 15*, though the aggregate *spikelets* escaped him.

12. *C. incurva*. Curved Carex.

Spikelets crowded into a dense head. Lower florets fertile. Bracteas membranous. Stem roundish, smooth. Leaves channelled.

C. incurva. *Lightf.* 544. *t. 24. f. 1*. *Fl. Br.* 971. *Engl. Bot.* v. 13. *t. 927*. *Willd. Sp. Pl.* v. 4. 217. *Hook. Scot.* 261. *Schk. Car.* 27. *t. H, h. f. 95*.

C. juncifolia. *Allion. Pedem.* v. 2. 264. *t. 92. f. 4*. *Sm. Tour on the Continent*, ed. 2. v. 3. 142.

C. Fl. Dan. *t. 432*.

C. n. 1354. *Hall. Hist.* v. 2. 183.

C. n. 86. *Gmel. Sib.* v. 1. 145. *t. 30. f. 2*.

About the mouths of alpine rivers, in a sandy soil, but rare.

In deep loose sea sand, at the mouth of the Naver, and near Skelherry in Dunrossness, Shetland. *Dr. Hope*. On a sandy flat part of Aberdeen Links, near the mouth of the Don. *Prof. Beattie*.

Perennial. *July, August*.

Root long and thread-shaped, creeping very extensively. Stem from 2 to 5 inches high, most generally ascending with a curve, nearly round, or bluntly angular, striated, smooth to the touch, leafy at the bottom only. Leaves shorter than the stem, linear, acute, curved, channelled, smooth. Spikelets sessile, ovate, densely crowded into a terminal, brown, somewhat three-lobed, head. Bracteas shorter than the spikelets, elliptical, concave, membranous, brown with pale edges, slightly keeled. Scales like them, but more acute, and flatter. Fertile florets in the bottom part of each spikelet, each with a very short style, and 2 long stigmas. Barren ones above them, rather more numerous. Stam. 3. Fruit ovate, smooth-edged, with a slightly notched beak. Seed lenticular.

On the Alps the stem is almost always straight, and rather taller than on the driving sand of the northern coasts.

Scheuchzer's *t. 11. f. 7*, quoted by Haller, cannot surely be our plant.

13. *C. arenaria*. Sea Carex.

Spikelets numerous, crowded into an oblong spike; upper ones chiefly of barren, lower of fertile, florets. Bracteas membranous; lower ones leafy. Stem triangular. Leaves flat. Fruit winged.

C. arenaria. *Linn. Sp. Pl.* 1381. *Fl. Suec.* ed. 2. 325. *Willd. v. 4.* 223. *Fl. Br.* 971. *Engl. Bot.* v. 13. *t. 928*. *With* 90. *t. 20*.

Hook. Scot. 261. *Schk. Car.* 14. *t. B. f.* 6. *D, d. f.* 6. *Dicks. H. Sicc. fasc.* 5. 14. *Don. H. Br.* 195. *Ehrh. Phytoph.* 17. *Pl. Off.* 389.

C. repens. *Bellard. Mem. de l'Acad. de Turin, v. 5.* 248; from the author.

C. maritima humilis, radice repente, caule trilatere, spicâ spadiceâ, nonnihil foliosâ, capitulis crassioribus, capsulis marginatis. *Mich. Gen.* 67. *t. 33. f.* 4.

Gramini cyperoidi ex monte Ballon simile humilior, in maritimis et arenosis nascens. *Raii Syn.* 423. *Pluk. Almag.* 178. *Phyt. t. 34. f.* 8.

Gramen cyperoides minus repens, spicâ divisâ. *Læs. Pruss.* 116. *t. 31.*

On the sandy sea shore in abundance.

Perennial. *June.*

Root very long and cord-like, spreading in the loose sand to a great extent, branching at the extremity, and sending out from the knots many shaggy fibres. Hence it powerfully binds the sand together, forming banks which resist the force of the ocean. *Stems* terminal, solitary, about a foot high, erect, except in a driving sand, triangular; rough-edged, in the upper part; leafy below. *Leaves* several, flat, rough-edged, taper-pointed, about as tall as the stem. *Spike* erect, $1\frac{1}{2}$ or 2 inches long, of many, more or less crowded, roundish-ovate, brown *spikelets*; the upper ones consisting almost entirely of *barren florcts*, with 3 *stamens*; lower principally of *fertile ones*, with 2 sessile *stigmas*, the latter being always inferior. *Scales* lanceolate, acute. *Fruit* ovate, ribbed, flattened, bordered in its upper half with a dilated rough-edged membrane, and terminating in a cloven beak. There is always a bristle-pointed leafy *bractea*, under one, or more, of the lower *spikelets*.

Haller's n. 1362, or his 1363, has been occasionally taken for *C. arenaria*, but the son of that distinguished writer assured Mr. Davall that this, truly maritime, species had never been found in Switzerland.

14. *C. intermedia.* Soft Brown Carex.

Spikelets numerous, crowded into an oblong dense spike; the lowermost and terminal ones fertile; intermediate ones barren. *Stem* upright, triangular.

C. intermedia. *Gooden. Tr. of L. Soc. v. 2.* 154. *Fl. Br.* 972. *Engl. Bot. v. 29. t.* 2042. *Willd. Sp. Pl. v. 4.* 224. *Hook. Scot.* 262. *Schk. Car.* 16. *t. B. f.* 7. *Fl. Dan. t.* 1343. *Dicks. H. Sicc. fasc.* 7. 15.

C. disticha. *Huds.* 403. *Ehrh. Calam.* 48.

C. arenaria. *Leers* 195. *t. 14. f.* 2.

C. n. 1363. *Hall. Hist. v. 2.* 186; omitting the references to *Plukenet* and *Læsel*.

Gramini cyperoidi ex monte Ballon simile, spicâ totali e pluribus spicis compositâ. *Raii Syn.* 423. *Pluk. Alm.* 178. *Phyt. t.* 34. f. 7; bad.

In marshy watery meadows.

Perennial. *May, June.*

Root creeping, running deep into the ground. *Stems* erect, 12 or 18 inches high, with 3 rough unequal angles. *Leaves* sheathing the lower part of the stem, but scarcely reaching its summit, grass-green, flat, taper-pointed, rough at the edges and keel. *Spike* oblong, bluntish, of a rusty brown, soft, moderately compressed, but by no means two-ranked, composed of numerous ovate acute *spikelets*, whose upper *florets* are barren, lower fertile. Several of the lower more distant *spikelets*, as well as one or more at the top, consist almost entirely of fertile *florets*; while the numerous crowded ones in the middle part of the common *spike* or *catkin* are almost completely barren; and as these wither, leaving the others to ripen seed, they give a peculiar aspect and character to the present species. *Bracteas* ovate, acute, rusty, keeled, with a white membranous margin, often torn; the lowermost with a slender leafy point, not so long as the spike. *Scales* much like the *bracteas*. *Fruit* ovate, bordered, rough-edged, with a cloven beak. *Stigmas* sometimes 3.

15. *C. divisa*. Bracteated Marsh Carex.

Spike dense, once or twice compounded. *Spikelets* of barren and fertile *florets*, the latter inferior, most numerous. *Bractea* leafy, erect. *Fruit* not spreading. *Root* creeping.

C. divisa. *Huds. ed.* 1. 348. *ed.* 2. 405. *Fl. Br.* 973. *Engl. Bot.* v. 16. t. 1096. *Gooden. Tr. of L. Soc.* v. 2. 157. t. 19. f. 2. *Willd. Sp. Pl.* v. 4. 233. *Hook. Scot.* 262. *Schk. Car.* 19. t. R and V, v. f. 61.

Gramen cyperoides ex monte Ballon, spicâ divulsâ. *Raii Syn.* 423; the synonyms doubtful.

In marshes, especially towards the sea.

Near the Hithe at Colchester, and elsewhere. *Mr. Newton.* By Hithe in Kent. *J. Sherard.* Near Acle bridge, Norfolk. *Mr. C. Bryant.* At Cley. *Mr. Woodward.* Near Hull. *Mr. Teesdale.* At Kennington. *Mr. Groult.*

Perennial. *May, June.*

Root stout and contorted, creeping widely, with strong fibres. *Stems* upright, but rather weak and slender, a foot or more in height, triangular; roughish in the upper part. *Leaves* narrow, erect, bright green, sheathing the base of the stem, various in length. *Spike* about an inch long, dark brown, not reddish. ovate; with an upright, leafy, triangular *bractea*, from 1 to 3

inches in length. *Spikelets* less numerous than in the last, irregularly clustered, ovate ; the lower ones often subdivided. *Fertile florets* most numerous in every spikelet, and below the barren ones. *Scales* elliptical, strongly keeled and pointed, with a filmy border ; their disk dark brown ; base green. *Stam.* 3. *Stigm.* 2, twice the length of the *style*. *Fruit* shorter than the scales, ovate, dilated and rough at the edges, cloven at the point. The old authors cited by Ray, may or may not intend this species, nor can they be relied on for any illustration of a plant so nearly resembling several others.

16. *C. muricata*. Greater Prickly Carex.

Spike oblong, dense, prickly with the broad, rough-edged, cloven, spreading beaks of the fruit. Spikelets roundish, mostly simple. Root fibrous.

C. muricata. Linn. *Sp. Pl.* 1382. Willd. v. 4. 234. Fl. Br. 974. Engl. Bot. v. 16. t. 1097. Hook. Scot. 262. Schk. Car. 20. t. E. f. 22 ; not t. D, d. Ehrh. Calam. 97.

C. spicata. Huds. 405. Lightf. 548. Not of Linnæus.

C. n. 1365. Hall. Hist. v. 2. 187 ; with confused references.

C. palustris media, radice fibrosâ, caule exquisitè triangulari, spicâ brevi compactiori. Mich. Gen. 69. t. 33. f. 14.

Gramen cyperoides spicatum minus. Raii Syn. 424.

G. sylvaticum tenuifolium rigidiusculum. Moris. v. 3. 244. sect. 8. t. 12. f. 27.

β. *Carex muricata* β. Fl. Br. 975. Willd. *Sp. Pl.* v. 4. 235. Gooden. Tr. of L. Soc. v. 2. 160.

C. loliacea ? Schk. Car. 22. t. E, e. f. 91.

C. nemorosa, fibrosâ radice, angustifolia, minima, caule exquisitè triangulari, spicâ brevi interruptâ. Mich. Gen. 69. t. 33. f. 12, R.

Gramen cyperoides, spicis minoribus, minusque compactis. Scheuchz. Agr. 488. t. 11. f. 5.

In moist pastures and shady places, especially where the soil is sandy, frequent.

β. On dry gravelly ditch banks, near Eaton, Shropshire. Rev. E. Williams.

Perennial. May, June.

Root tufted, of numerous shaggy fibres, not creeping. *Herbage* of a bright grass green. *Stems* erect, 12 or 18 inches high, naked, except at the bottom, triangular, striated ; the angles more or less rough in their upper part. *Leaves* narrow, acute, rough at the edges and keel, various in height, sometimes taller than the stem ; pale, entire and sheathing at the base. *Spike* oblong, obtuse, an inch or inch and half long, of a rusty hue, mixed with green. *Spikelets* 8 or 10, partly bracteated, sessile, with a few barren *florets* in the upper part of each, and more

numerous fertile ones below, ovate when in blossom, afterwards globose and more spreading, all rather near together, even the lowermost not more than its own length distant from the next. This lowest *spikelet* is rarely somewhat enlarged, or compound. *Bracteas* ovate, membranous, keeled, the bristly point of the lower one sometimes rising much above the spikelet. *Scales* ovate, rusty-coloured, pointed, with a green keel. *Fruit* longer than the scales, ovate, green, finally brown, spreading, externally convex, with a broad, flat, rough-edged, cloven beak, whose points render the whole spike prickly, as the name expresses. *Stigmas* 2, long and twisted.

In some Swiss specimens the *fruit* is partially elongated, and tumid ; apparently diseased.

β appears to be a variety, caused by dryness of soil, having smaller rounder *spikelets*, all quite simple, and a rather smoother *stem*. Schkuhr represents the beak of the *fruit* shorter than in our Shropshire plant, but this is not always so correctly attended to in his exquisite figures as most other characters.

17. *C. divulsa*. Grey Carex.

Spike elongated, lax. Spikelets of its lower half finally very distant, mostly single. Fruit erect, smooth-edged; roughish at the cloven point of the beak. Root fibrous.

C. divulsa. Gooden. *Tr. of L. Soc.* v. 2. 160. *Fl. Br.* 975. *Engl. Bot.* v. 9. t. 629. *Willd. Sp. Pl.* v. 4. 235. *Schk. Car.* 20. t. W, w. f. 89. “ *Host. Gram.* v. 1. 42. t. 55.”

C. caneseens. Huds. 405.

C. muricata β . *Wahlenb. in Stockh. Trans. for* 1803. 143.

C. divisa. Don. *H. Br.* 196.

C. nemorosa, fibrosâ radice, caule exquisitè triangulari, spicâ longâ, divulsâ, seu interruptâ, capitulis omnibus solitariis. *Mich. Gen.* 69. t. 33. f. 11.

Gramen cyperoides spieatum minus, spicâ longâ divulsâ seu interruptâ. *Raii Syn. ed.* 2. 269 ; *with a good description* : *ed.* 3. 424 ; *with a false reference to Læsel, introduced by Dillenius. Petiv. Conc. Gram.* 6. n. 184.

G. cyperoides gracile alterum, glomeratis torulis spatio distantibus. Lob. Illustr. 61.

G. cyperoides, echinatâ et rarâ, spicâ, nemorosum minus. Barrel. Ic. t. 20. f. 2.

β . *Carex nemorosa*, fibrosâ radice, caule exquisitè triangulari, spicâ longâ, divulsâ, seu interruptâ, capitulis solitariis præterquam ultimo. *Mich. Gen.* 69. t. 33. f. 10 ; *copied and coloured in Schk. Car. t. D, d. f.* 89.

In moist shady pastures, not uncommon.

Perennial. May.

Root tufted, of many stout, partly shaggy, fibres. *Herbage* bright

grass green ; the *spikes* paler than the last, and rather white, or greyish, in every stage of their growth. *Stems* 12 or 18 inches high, weak, and partly reclining, with 3 acute rough angles. *Leaves* sheathing the bottom of the stem, and usually rising above its summit, rough at the edges and keel. *Spike* when in flower an inch, or inch and half, long, of from 6 to 10, or more, sessile, erect, ovate, acute *spikelets*, each subtended by an ovate, concave, close, membranous *bractea*, with a green taper point and keel, 2 or 3 of the lowermost bracteas being often lengthened out into an extremely slender, rough, capillary appendage. The *spikelets* are rarely in pairs ; the lowermost of all sometimes compound. Each consists of several barren *florets*, with about as many fertile ones below them. As the latter ripen *seed*, the spikelets become roundish, or hemispherical, 3 or 4 of the lower ones being widely separated from each other. *Scales* ovate, or lanceolate, membranous, hardly so long as the *fruit*, which is broadly ovate, externally convex, flat or concave within, moderately spreading, not reflexed, pale, with a thick green margin, very smooth in every part, except a slight roughness near the cloven point of the *beak*, of ten scarcely perceptible. *Stam.* 3. *Stigm.* 2.

β is rather an accident than a variety, having a division, or branch, at the bottom of the spike, which perhaps Micheli alone has met with.

The figure in *Engl. Bot.* is very incomplete, as wanting the *fruit*, which in its ripening state clearly distinguishes this species from the last. Dr. Wahlenberg unites them, having apparently never seen *C. divulsa*, which though well known to English botanists, is rare on the continent. Specimens are in the Linnæan herbarium, without any place of growth or name, and I have some from Switzerland. Dr. Hooker follows Wahlenberg. Having carefully examined the question, I am satisfied, even without an appeal to the great names of Ray, Micheli, Hudson, and Good-enough.

18. *C. vulpina*. Great Compound Prickly Carex.

Spike thrice compound, dense, obtuse. Fruit spreading, with a notched rough-edged beak. Scales pointed. Angles of the stem compressed, very sharp.

C. vulpina. Linn. *Sp. Pl.* 1382. Willd. v. 4. 231. Fl. Br. 976. Engl. Bot. v. 5. t. 307. Hook. Scot. 262. Fl. Dan. t. 308. Leers 196. t. 14. f. 5. Schk. Car. 17. t. C. f. 10. Ehrh. Calam. 87.

C. n. 1364. Hall. Hist. v. 2. 187 ; excluding Barrelier's syn.

C. palustris major, radice fibrosâ, caule exquisitè triangulari, spicâ brevi, habitiori, compactâ ; also spicâ longâ, divulsâ, seu interruptâ. Mich. Gen. 69. t. 33. f. 13.

Gramen cyperoides palustre majus, spicâ compactâ. Raii Syn. 423.

Bauh. Theatr. 87. *f.* *Moris. v.* 3. 244. *sect.* 8. *t.* 12. *f.* 24.

G. cyperoides palustre triquetrum, spicâ integrâ. Bauh. Hist.
v. 2. 497. *f.*

G. palustre cyperoides. Ger. Em. 21. *f.* *Lob. Ic.* 19. *f.*

Scirpoides palustre majus, spicâ compactâ. Mont. Prodr. 17. *f.*
F, H.

In watery places, and the margins of ponds and rivers.

Perennial. *May.*

Root fibrous, tufted, not creeping. *Stems* straight and firm, 2 feet high, leafy in the lower part only, very sharply triangular, with compressed, rough, cutting angles; the interstices concave; the summit about twice as thick as the main stalk of the spike, into which it is suddenly contracted. *Leaves* deep green, taller than the stem, rather broad, with a rough keel and edges, to be handled cautiously. *Spike* twice or thrice compounded, oblong, obtuse, erect, 2 or 3 inches long, usually dense, or slightly interrupted, with several long, taper, rough, spreading *bractæas*, ovate at their base, from the lower part of the spike; but these are not constantly protruded. *Ultimate spikelets* ovate, dense, with numerous barren *florets* above the fertile ones. *Scales* ovate, acute; the lower ones especially rather abrupt, with long points. *Fruit* widely spreading, brown, ovate, ribbed, tapering into a flat, serrated beak, notched at the point, but less rigid, or prickly, than in *C. muricata*.

Haller speaks of this as a variable species, not having clearly understood its limits or synonyms.

19. *C. teretiuscula*. Lesser Panicked *Carex*.

Spike twice or thrice compound, dense. *Fruit* spreading, tumid at one side, with a tapering, serrated beak. *Stem* triangular, with convex interstices.

C. teretiuscula. Gooden. Tr. of L. Soc. v. 2. 163. *t.* 19. *f.* 3. *Fl. Br.*
977. *Engl. Bot. v.* 15. *t.* 1065. *Willd. Sp. Pl. v.* 4. 244. *Schk.*
Car. 30. *t.* D. *f.* 19. T. *f.* 69. *Don. H. Br.* 189.

In boggy watery meadows.

On St. Faith's bogs near Norwich; and at Barton mills, Suffolk. *Mr. Crowe.* In bogs and marshes to the north of Queen's ferry, Scotland. *Mr. J. Mackay.* Near Aberdeen. *Prof. Beattie.* Near Forfar. *Mr. G. Don.* Pembrokeshire. *Mr. Dickson.* North of England. *Mr. R. Teesdale, and others.*

Perennial. *May.*

Root blackish, fibrous, or slightly creeping, not densely tufted like the following. *Stems* 12 or 18 inches high, upright, slender, with 3 sharp angles, whose intermediate spaces are convex, with a prominent line in their centre, so that a transverse section of

the stem shows it to be almost cylindrical. The edges are roughish. *Leaves* sheathing the lower part of each stem, erect, about as tall as the stem, deep green, rough at the edges and keel, very narrow, acute. *Spike* erect, ovate, or oblong, rather acute, $1\frac{1}{2}$ inch long, twice or thrice compound, densely paniced, scarcely lobed, and not at all open or spreading. *Spikelets* ovate. *Scales* acute, membranous, very smooth. Barren *florets* superior, most numerous. Fertile ones about 6. *Bractes* membranous, ovate, acute; the lowermost often ending in a rough, leafy point, of no great length. *Fruit* brown, ribbed, smooth, tumid at one side; its *beak* gradually tapering from a broad base into a lanceolate form, strongly serrated at the edges, notched at the tip. *Stam.* 3. *Stigm.* 2. *Seed* semiorbicular.

Ray evidently indicates this species in his *Synopsis*, ed. 2. 268, after his account of our following one, observing that it grows in a scattered manner, not in dense tufts. This important character, added to the remarks of the learned Bishop of Carlisle and of Mr. Crowe, preclude all doubt of these two species being certainly distinct, nor can any one who compares them with due attention judge otherwise.

20. *C. paniculata*. Great Paniced *Carex*.

Spike thrice compound, loosely paniced, interrupted, acute. *Fruit* spreading, with an abrupt serrated beak, *Stem* sharply triangular, with flat interstices.

C. paniculata. *Linn. Sp. Pl.* 1383. *Willd. v.* 4. 244. *Fl. Br.* 978. *Engl. Bot. v.* 15. *t.* 1064. *Hook. Scot.* 262. *Leers* 198. *t.* 14. *f.* 4. *Schk. Car.* 33. *t.* D. *f.* 20. *Ehrh. Calam.* 69.

C. n. 1368. *Hall. Hist. v.* 2. 188; syn. incorrect.

C. radice repente, caule exquisitè triangulari, spicâ multiplici ferrugineâ; et spicâ multiplici fuscâ. *Mich. Gen.* 68. *t.* 33. *f.* 7.

Gramen cyperoides palustre elatius, spicâ longiore laxâ. *Raii Syn.* 422. *Moris. v.* 3. 244. *sect.* 8. *t.* 12. *f.* 23.

Cyperus alpinus longus inodorus, paniculâ ferrugineâ minùs sparsâ. *Scheuchz. Prodr.* 27. *t.* 8. *f.* 2.

In wet pastures and spongy bogs.

Perennial. *June*.

Root of many long stout fibres, by no means creeping, but tufted.

Plant twice the size of the foregoing, with much broader *leaves*. *Stem* much stouter, 2 or 3 feet high, and essentially distinguished by having 3 acute rough angles, whose intermediate spaces are flat, striated, without any central rib. *Spike* paniced in the first instance, the branches spreading, spiked, twice compound, with numerous ovate, crowded, sessile, brown or rusty *spikelets*. *Scales* membranous, ovate, acute, smooth. Barren *florets* superior, numerous; fertile few. *Fruit* rounded below, convex,

with a serrated, partly fringed, notched *beak*, which when ripe is narrow and abrupt at the base, not broad nor gradually tapering.

Ray, and others who have accurately observed this *Carex*, remark that it forms large dense tufts, like those of Rushes, safely to be walked upon, which is not the case with *C. teretiuscula*. By this mode of growth it gradually changes the most rotten bogs into profitable meadows, capable at length of producing better herbage. My worthy friend Hooker surely cannot think that either science or agriculture are endangered, by plants, so much alike, yet so distinct in character and economy, being correctly discriminated.

*** *Barren and fertile florets in separate catkins; the barren catkin solitary. Bracteas membranous. Stigmas three.*

21. *C. digitata*. Fingered Carex.

Bracteas membranous, sheathing, scarcely leafy. Catkins linear, lax, erect; the barren one shortest; fertile two or three. Leaves flat.

C. digitata. Linn. *Sp. Pl.* 1384. Willd. v. 4. 256. Huds. 409. Fl. Br. 979. Engl. Bot. v. 9. t. 615. Leers 199. t. 16. f. 4. Schk. Car. 76. t. H. f. 38. Fl. Dan. t. 1466. Ehrh. Calam. 120.

C. n. 1376. Hall. Hist. v. 2. 191.

Cyperoides montanum nemorosum, caule triquetro-compresso, spicis ferrugineis tenuioribus, inter se distantibus, capsulis rarius dispositis, oblongis, turbinatis, trilateris. Mich. Gen. 65. t. 32. f. 9.

Gramen caryophyllatum montanum, spicâ variâ. Bauh. Prodr. 9. f. Theatr. 48. f. Scheuchz. Agr. 448. t. 10. f. 14. Moris. v. 3. 243. sect. 8. t. 12. f. 15; bad.

G. caryophyllatum polycarpon, fructu triangulo. Læs. Pruss. 112. t. 27.

In woods and thickets, among limestone rocks, rare.

Near Bath. Mr. Sole. Under St. Vincent's rocks, Bristol, on the southside of the river. Mr. W. Clayfield. Woods at Thorp-Arch, Yorkshire. Sir T. Frankland, Bart. Abundantly in Mackershaw wood near Ripon. Mr. W. Brunton, jun.

Perennial. May.

Roots tufted, of many shaggy dark fibres. Stems slender, 6 or 8 inches high, ascending, obscurely triangular, smooth, naked, except at the base, where they are wrapped in dark-red sheaths, as well as with the red sheaths of the green, grassy, flat, pointed leaves, various in height, whose edges have been well observed by the Bishop of Carlisle to be rough with reflexed teeth toward the base, smooth in the middle, and rough with teeth pointing upwards near the extremity; their rib smooth. Fertile catkins

usually two, stalked, erect, rather distant, with an intermediate sessile barren one, not rising so high as the uppermost. *Bracteas* solitary, at the base of each stalk or catkin, tubular, or involute, red brown, with a white, membranous, oblique margin, acute, very rarely tipped with a minute leafy point. *Scales* obovate, abrupt, red brown, with a green keel, and membranous white margin, broadest in those of the barren catkin, which are most imbricated. *Stam.* 3. *Stigm.* 3, on a short *style*. *Fruit* obovate, abrupt, triangular, green, downy, entire at the summit. *Seed* brown, smooth, sharply triangular.

C. pedata, long a doubtful plant, which could not be determined by the works or the herbarium of Linnæus, whose synonyms are incorrect, has been recovered by Dr. Wahlenberg, and figured in his *Fl. Lapp. t.* 14. Nothing, as he observes, can be more distinct from our *digitata*; as well as from *C. ornithopoda* of Willdenow, the *pedata* of Schkuhr, *t. H. f.* 37, Haller's n. 1375, and Micheli's *t.* 32. *f.* 14. The corymbose inflorescence of this last keeps it separate from *C. digitata*.

22. *C. clandestina*. Dwarf Silvery Carex.

Bracteas membranous, scarcely leafy. Fertile catkins remote, of few flowers, inclosed in the sheathing bracteas. Leaves channelled.

C. clandestina. Gooden. *Tr. of L. Soc. v.* 2. 167. *Fl. Br.* 980. *Engl. Bot. v.* 30. *t.* 2124. *Willd. Sp. Pl. v.* 4. 254. *Schk. Car.* 81. *t. K. f.* 43.

C. n. 1370. *Hall. Hist. v.* 2. 189.

C. humilis. *Leys, Hal.* 175. *Schreb. Lips.* 65. "*Host. Gram. v.* 1. 50. *t.* 67." *Ehrh. Phytoph.* 88.

C. prostrata. *Allion. Pedem. v.* 2. 267.

Cyperoides montanum humile angustifolium, culmo veluti folioso, spicis obsesso. *Scheuchz. Agr.* 407. *t.* 10. *f.* 1. *Mich. Gen.* 63. *t.* 32. *f.* 8.

On dry exposed limestone rocks, very rare.

On St. Vincent's rocks, Bristol, just below the Hot wells. *Mr. Sole*. Perennial. *May*.

Root woody, with many stout fibres. *Stems* from 1 to 3 inches high, erect, sheathed with *bracteas*, not leafy. *Leaves* radical, numerous, tufted, linear, narrow, channelled, smooth, lasting through the winter, and spreading widely as they advance in age. Edges of the *bracteas*, as well as of the *scales* of each *catkin*, remarkable for their silvery whiteness. Barren *catkin* terminal, erect, acute, many-flowered. Fertile ones 2 or 3, of very few *florets*, concealed, except their 3 long *stigmas*, in the hollows of the *bracteas*. *Stam.* 3. *Style* scarcely any. *Fruit* obovate, triangular, downy, entire at the summit. *Seed* triangular.

This and the foregoing are among the most uncommon and distinct, as well as the most elegant, of our English species of *Carex*.

**** *Barren and fertile florets in separate catkins; the barren catkin solitary, very rarely or occasionally more than one. Bracteas leafy, often sheathing.*

23. *C. pendula*. Great Pendulous Carex.

Sheaths nearly as long as the flower-stalks. Fertile catkins cylindrical, very long, drooping. Fruit densely crowded, ovate, beaked.

C. pendula. Huds. ed. 1. 352. ed. 2. 411. Fl. Br. 981. Engl. Bot. v. 33. t. 2315. Willd. Sp. Pl. v. 4. 288. Hook. Scot. 264. Curt. Lond. fasc. 3. t. 63. Pursh. 413. Schk. Car. 100. t. Q. f. 60.

C. Agastachys. Ehrh. in Linn. Suppl. 414. Phytoph. 19.

C. maxima. Scop. Carn. v. 2. 229.

C. n. 1396. Hall. Hist. v. 2. 196.

Gramen cyperoides, spicâ pendulâ longiore. Raii Syn. 420. Moris. v. 3. 242. sect. 8. t. 12. f. 4.

G. cyperoides latifolium, typhâ pendulâ longiore. Barrel. Ic. t. 45.

In moist woods and hedges.

In ditches about Braintree, Essex, and elsewhere. Ray. About London in many places, as Hampstead, Highgate, and between Paddington and Kensington. The late Mr. Woodward found it near Woodbridge, Suffolk; Dr. Stokes in Woreestershire and Shropshire; Mr. Robson by the river Tees; the Rev. Dr. Stuart in Breadalbane; and the Bishop of Carlisle near Hastings.

Perennial. May, June.

Root fibrous, tufted. Stem from 3 to 6 feet high, triangular, leafy, roughish at the angles near the top only. Leaves large, recurved, harsh, grass-green; minutely rough at the edges and keel; somewhat glaucous underneath; closely sheathing at the base. Bracteas like the leaves, their sheaths commonly as long as the flower-stalks. Catkins 6 or 7, long, cylindrical, drooping, very dense, greenish; all but the uppermost, and perhaps a part of the next, consisting of innumerable, densely crowded, fertile florets. Scales of all the catkins lanceolate, acute, brown, with a pale keel. Stam. 3. Stigm. 3. Fruit green, ovate, tumid, triangular, smooth with a notched beak. Seed triangular, brown. A few fertile florets occasionally occur at the end of the barren catkin, and some barren ones in the second or third.

Scopoli's name might well have suited this fine *Carex*, as being one of the largest; but Hudson's, equally apt, has a prior right.

24. *C. strigosa*. Loose Pendulous Carex.

Sheaths nearly equal to the flower-stalks. Catkins slender,

loose, slightly drooping. Fruit lanceolate, triangular, ribbed.

C. strigosa. Huds. 411. Gooden. Tr. of L. Soc. v. 2. 169. t. 20. f. 4. Fl. Br. 982. Engl. Bot. v. 14. t. 994. Dicks. Dr. Pl. 86. Hook. Scot. 264. Willd. Sp. Pl. v. 4. 289. Schk. Car. 94. t. N. f. 53.

C. Leptostachys. Ehrh. in Linn. Suppl. 414. Phytoph. 48.

Gramen cyperoides polystachyon majusculum latifolium, spicis multis, longis, strigosis. Raii Syn. 419.

In groves and thickets, rare.

In a lane at Black Notley, Essex; Mr. Dale. Ray. In Witham wood, near Oxford. Rev. Dr. Sheffield. Noke wood. Sibth. Bedfordshire. Abbot. Hedenham wood, Norfolk. Mr. Stone.

Perennial. April, May.

Root fibrous. Whole plant much smaller, and more slender, than the last, of a light grass green, smooth in every part, except the edges and rib of the leaves. Stem 2 feet high, bluntly triangular. Bractees leafy, sheathing the flower-stalks almost entirely. Fertile catkin about 4, loose and slender; barren one more dense. Scales lanceolate. Stam. 3. Stigm. 3. Fruit green, ovate-lanceolate, ribbed, scarcely notched, not beaked. Seed elliptical, triangular.

25. *C. sylvatica.* Pendulous Wood Carex.

Sheaths not half the length of the flower-stalks. Catkins slender, rather loose, drooping. Fruit ovate, triangular, beaked, without ribs.

C. sylvatica. Huds. ed. 1. 353. ed. 2. 411. Gooden. Tr. of L. Soc. v. 2. 183. Fl. Br. 983. Engl. Bot. v. 14. t. 995. Linn. Fl. Lapp. ed. 2. 263. Dicks. H. Sicc. fasc. 9. 13. Hook. Scot. 264. Pursh. 416. Schreb. Lips. 62. Fl. Dan. t. 404. Schk. Car. 111. t. L, 1. f. 101. "Host. Gram. v. 1. 62. t. 84."

C. Drymeia. Ehrh. in Linn. Suppl. 414. Phytoph. 58. Willd. Sp. Pl. v. 4. 296. Car. Berol. 26. t. 3. f. 3.

C. vesicaria β. Linn. Sp. Pl. 1389.

C. patula. Scop. Carn. v. 2. 226. t. 59. Pollich v. 2. 597. Villars Dauph. v. 2. 214.

C. capillaris. Leers 202. t. 15. f. 2.

C. n. 1395. Hall. Hist. v. 2. 196.

Gramen cyperoides sylvarum tenuius spicatum. Raii Syn. 419. Moris. v. 3. 243. sect. 8. t. 12. f. 9. Scheuchz. Agr. 418. Lob. Illustr. 60.

In woods common, especially on a clay soil which is wet in winter. Perennial. May, June.

Root tufted, with stout fibres. Herbage of a bright grass green, about the size of the last, but stouter. Stem smooth, triangular, with striated, rather convex, interstices. Leaves rough on their

upper surface, as well as at the edges and keel. *Flower-stalks* drooping, long and slender, sheathed by the *bracteas* at the base chiefly, and very seldom half way up. Fertile *catkins* about 4, lax, though thicker than in the last; barren 1 or 2. *Scales* ovate, acute. *Stam.* 3. *Stigm.* 3. *Fruit* brown, smooth, ovate, with 3 green angles, but no lateral ribs, terminating in a *beak* nearly its own length, cloven at the summit. *Seed* turbinate, triangular.

It is remarkable that Linnæus, after having well determined this *Carex* in his *Flora Lapponica*, where he records its use to the Laplanders, when carded and dressed, as a protection from severe cold, should have made it a variety of his *C. vesicaria*; to which indeed it is rather more allied than to our *strigosa*, but nevertheless a most distinct species.

26. *C. depauperata*. Starved Wood *Carex*.

Sheaths much shorter than the flower-stalks. Fertile catkins distant, erect, of about three florets. Fruit inflated, ribbed, with a notched beak.

C. depauperata. Gooden. *Tr. of Linn. Soc.* v. 2. 181. *Fl. Br.* 984. *Engl. Bot.* v. 16. t. 1098. *Hook. Scot.* 264. *Willd. Sp. Pl.* v. 4. 278.

C. ventricosa. *Curt. Lond. fasc.* 6. t. 68.

C. triflora. *Willd. Phytogr. fasc.* 1. 2. t. 1. f. 2. *Schk. Car.* 94. t. M. f. 50.

Cyperoides vesicarium humile, locustis rarioribus. *Tourn. Inst.* 530; by his herbarium.

In dry woods, but rare.

In Charlton wood, Kent. *Bishop of Carlisle*. Near Godalmin, Surrey. *Mr. Dickson*. Near Forfar, Scotland, sparingly. *Mr. G. Don*.

Perennial. *May, June*.

Root somewhat creeping. *Stem* about 18 inches high, erect, leafy, bluntly triangular, smooth, striated. *Leaves* light green, rough at the edges and keel, with long close sheaths. *Bracteas* like them, but with shorter sheaths. Fertile *catkins* usually 3, remote, erect, stalked, short, lax; each of 2 or 3 *florets*; barren one terminal, lanceolate, dense, of many *florets*. *Scales* membranous, ovate. *Stam.* 3. *Stigm.* 3. *Fruit* large, green, ovate, tumid, triangular, copiously ribbed, smooth, with a *beak* nearly its own length, oblique and membranous, scarcely cloven, at the extremity. *Seed* obtuse, triangular, of a shining brown.

Willdenow has distinguished Micheli's t. 32. f. 5 as a species, by the name of *C. Michelii*, *Sp. Pl.* v. 4. 277. It has 5 or 6 fertile *florets*, whence an error has slipped into the *Fl. Br.*, from which Micheli's synonym must be excluded. Curtis quotes this author still more erroneously.

27. *C. Mielichoferi*. Loose-spiked Rock Carex.

Sheaths not half the length of the flower-stalks. Fertile catkins three, distant, erect, lax. Fruit ovate, tumid, triangular, rough-edged; its beak cloven, membranous at the summit.

C. Mielichoferi. Willd. *Sp. Pl.* v. 4. 276. "*Schk. Car. f.* 198."

Comp. ed. 4. 152. *Engl. Bot.* v. 32. t. 2293. *Hook. Scot.* 264.

C. alpina; Hoppe. Willd.

On alpine rocks in the Highlands of Scotland.

Upon the rocky ledges of Craig Challoch, Breadalbane. *Mr. W. Borrer*.

Perennial. *August*.

Root dark brown, creeping. *Stems* a foot high, leafy, smooth, roundish. *Leaves* flat, smooth. *Bracteas* like them, but more tapering. Fertile *catkins* 3, on stalks thrice the length of the *sheaths*, erect, hardly an inch long, cylindrical, lax; the lowermost of about 12 *florets*, uppermost of half as many; barren one of nearly the same shape and size, with more *florets*, and longer blunter *scales*. *Stam.* 3. *Stigm.* 3. *Fruit* ovate-oblong, triangular; the edges rough upwards; *beak* short, rounded, membranous and cloven at the end; longer than the rounded, rusty *scales*.

28. *C. speirostachya*. Dense short-spiked Carex.

Sheaths shorter than the flower-stalks. Fertile catkins about three, distant, erect, ovate, dense, many-flowered. Fruit ovate, triangular, ribbed, smooth, with a deeply cloven beak, membranous at the orifice.

C. speirostachya. Swartz *Ms.*

C. distans. *Fl. Dan.* t. 1049.

C. n. 1382 β . *Hall. Hist.* v. 2. 193.

C. n. 1383. *Hall. Nomencl.* 125.

In marshes among the Scottish hills.

About Mugdoch castle, 9 miles north of Glasgow; also on the hills of Lanarkshire and Perthshire. *Mr. David Don*.

Perennial. *July, August*.

Root brown, creeping. *Stem* from 9 to 15 inches high, erect, firm, triangular, smooth; leafy at the base. *Leaves* chiefly radical, upright, firm, flat, taper-pointed, for the most part smooth, except a slight and partial marginal roughness, their height scarcely half that of the stem. *Bracteas* narrower; the lower ones with a sheathing base, seldom half so long as the *flower-stalks*; the upper much shorter. Fertile *catkins* mostly 3, half or three quarters of an inch long, tawny, ovate, dense, many-flowered, with acute, but not pointed, *scales*; barren one lanceo-

late, of numerous, rusty, blunt *scales*, usually solitary, rarely accompanied by another much smaller; and sometimes there are a few barren *florets* at the summit of a fertile *catkin*, especially when the uppermost of the latter are aggregate, and shortened. *Stam.* 3. *Stigm.* 3. *Fruit* green, ovate, triangular, ribbed, smooth, with a deeply-cloven *beak*, whose orifice has narrow membranous edges. *Seed* obovate, with 3 angles.

This *Carex* has long puzzled the Swedish as well as Swiss botanists. It is mentioned by Wahlenberg, *Stockh. Trans.* for 1803, 157, (under the name I have adopted from Dr. Swartz,) as the same with my *binervis*, a very different plant. It is *C. Mielichhoferi* of Mr. D. Don in Hooker's *Fl. Scot.*, and I have Swiss specimens confirming the above references to Haller. The plate of *Fl. Dan.* t. 1049, having a pointed *scale* accompanying the *fruit*, formerly misled me to believe that plate might represent *C. distans*; but it certainly belongs to our present plant, as Mr. Davall long ago suggested.

29. *C. phæostachya*. Short-brown-spiked Carex.

Sheaths shorter than the flower-stalks. Fertile catkins two, distant, erect, ovate. *Fruit* ovate, triangular, smooth, with a cloven beak. Scales of the barren catkin pointed; of the fertile ones obtuse.

C. salina. Don *H. Br.* 216.

On the Highland rocks of Scotland.

Upon rocks on the high mountains of Cairn Gorm, Inverness-shire; also on the Clova mountains; and on Ben Macdowie, near the head of the river Dee. *Mr. G. Don.*

Perennial. *Junc.*

Roots creeping extensively, with long, smooth, pale, branched fibres. *Stem* solitary, 5 or 6 inches high, erect, somewhat triangular, furrowed, smooth; leafy at the base. *Leaves* upright, or a little spreading, flat, taper-pointed, smooth, about half the height of the stem. *Bractees* similar, but smaller, with considerable, rather swelling, *sheaths*. *Flower-stalks* triangular, smooth, longer than the sheaths, though shorter than the bractees. Fertile *catkins* distant, nearly half an inch long, ovate, rather dense, with broad, bluntish, pointless, dark-brown *scales*; barren one solitary, ovate, with ovate, dark-brown, acute, often considerably pointed, *scales*. *Stam.* 3. *Stigm.* 3. *Fruit* green tinged with brown, ovate, or elliptical, triangular, scarcely ribbed, smooth, with a broadish brown *beak*, projecting beyond the scale, acutely cloven, but less deeply than in the last, and destitute of the white membranous border for which that species is remarkable.

Very distinct from the preceding, though the characteristic marks

are not easily defined. The present resembles, in many respects, the *C. salina* of Wahlenberg, *Willd. Sp. Pl.* v. 4. 301, but that has only 2 *stigmas*, and the *catkins* are much less remote. Having then seen but one poor specimen of either, I led my late friend Mr. Don into an error as to the synonym of Swartz and Wahlenberg.

30. *C. capillaris*. Dwarf Capillary Carex.

Common sheath much shorter than the two or three capillary drooping flower-stalks. Fertile catkins ovate, rather loose, pendulous. Fruit ovate, triangular, pointed, without ribs; membranous at the tip. Root fibrous.

C. capillaris. *Linn. Sp. Pl.* 1386. *Willd. v.* 4. 291. *Fl. Br.* 985. *Engl. Bot. v.* 29. *t.* 2069. *Hook. Scot.* 265. *Dicks. H. Sicc. fasc.* 9. 14. *Don. H. Br.* 96. *Fl. Dan. t.* 168. *Scop. Carn. v.* 2. 220. *t.* 59. *Schk. Car.* 97. *t. O. f.* 56. *Wahlenb. Lapp.* 238.

C. filiformis, by mistake. *Sm. Tour on the Cont. ed. 1. v.* 3. 133.

C. n. 1394. *Hall. Hist. v.* 2. 196.

Cyperoides alpinum, spicis seminiferis pendulis, binis in summo caule. *Segu. Veron. v.* 3. 83. *t.* 3. *f.* 1.

On the Highland mountains of Scotland.

On Ben Teskerney, and other mountains in Breadalbane. *Rev.*

Dr. Stuart. On Ben Lawers; Mr. Maughan. *Hooker.*

Perennial. *July, August.*

Root tufted, of many slender, partly shaggy fibres. Stem slender, erect, roundish, striated, smooth, nearly naked, from 2 to 4 inches high, or more. Leaves chiefly radical, tufted, spreading, narrow, flat, taper-pointed, 2 or 3 inches long, rough-edged towards the extremity. Bractea generally solitary at the top of the stem, like the leaves, but smaller, sheathing at the base, erect, accompanied by 3 or 4 long, slender, capillary, triangular, rough, recurved flower-stalks. Fertile catkins 2 or 3, pendulous, ovate, short, rather lax, of from 6 to 10 florets, more or less; barren one terminal, lanceolate, rather shorter and more upright. Scales rusty, obtuse. Stam. 3. Stigm. 3. Fruit of a chesnut brown, ovate, smooth, triangular, without furrows or ribs, longer than the scales, tapering upward to a membranous-tipped point. Seed elliptical, with 3 sharp angles.

31. *C. rariflora*. Loose-flowered Alpine Carex.

Sheaths scarcely any. Fertile catkins lax, drooping, of few florets. Fruit obovate, triangular, slightly pointed, without ribs. Root creeping.

C. rariflora. *Engl. Bot. v.* 35. *t.* 2516. *Comp. ed.* 4, 152. *Hook. Scot.* 265. *Don. H. Br.* 215.

C. limosa γ , rariflora. *Wahlenb. in Stockh. Trans. for 1803.* 162.
Willd. Sp. Pl. v. 4. 294.

C. limosa β , rariflora. *Wahlenb. Lapp.* 242

In the alpine Highlands of Scotland.

At the head of a glen, called the Deil, among the mountains of Clova, Angusshire, near the limits of perpetual snow. *Mr. G. Don.*

Perennial. *July.*

Rather larger than the last, from which it differs in its widely creeping *root*, and less pointed or beaked *fruit*, but to which it is much more related than to *C. limosa*, especially in its *fruit*, which has 3 equal bluntish angles, with rather concave, smooth interstices, not striated or ribbed. *C. limosa* belongs to a tribe with compressed *fruit*. The *leaves* are roughish at the edges, towards the point. *Bracteas* strongly keeled, with a very short, ribbed *sheath*. *Scales* of all the *catkins* very dark, ovate, pointed. Fertile *catkins* rather ovate-oblong than linear. *Stigmas* 3, long, often cohering lengthwise.

32. *C. Pseudo-cyperus*. Bastard-cyperus Carex.

Sheaths scarcely any. Fertile catkins dense, cylindrical, drooping, many-flowered. Scales awl-shaped. Fruit spreading, lanceolate, furrowed, rough-edged, with a deeply cloven beak.

C. Pseudo-cyperus. *Linu. Sp. Pl.* 1387. *Willd. v. 4.* 295. *Fl. Br.* 986. *Engl. Bot. v. 4. t.* 242. *Hook. Scot.* 265. *Dicks. II. Sicc. fasc. 7. 14.* *Schlk. Car. 113. t. M, m. f.* 102. "*Fl. Dan. t.* 1117." "*Host Gram. v. 1. 63. t.* 85." *Ehrh. Calam.* 90.

C. n. 1397. *Hall. Hist. v. 2.* 196.

Gramen cyperoides, spicâ pendulâ brevior. *Raii Syn.* 419. *Moris. v. 3. 242. sect. 8. t. 12. f. 5.* *Bauh. Pin. 6. Theatr. 85. f.* Graminis cyperoidis genus, *Pseudo-cyperus* Lobelio, spicis vel panniculis pendentibus ex longis pediculis. *Bauh. Hist. v. 2.* 496. *f.*

Pseudo-cyperus. *Lob. Ic. 76. f.* *Ger. Em. 29. f.*

In wet shady places, and about the margins of rivers and ponds, not very uncommon.

On Hounslow heath. *Bishop of Carlisle.* On St. Faith's bogs near Norwich.

Perennial. *June.*

Notwithstanding its great size, and bright green colour, this species is more allied to 2 or 3 of the foregoing than to any of the following. The *root* is fibrous. *Stem* a foot or more in height, with 3 sharp rough angles, and crowned with several long, recurved, leafy, taper-pointed *bracteas*, slightly sheathing at the base, with many rough ribs, and rough edges. Fertile *catkins* 3 or 4, on long, triangular, rough *stalks*, green, droop-

ing, cylindrical, $1\frac{1}{2}$ or 2 inches long, one or two of them solitary from the lower *bracteas*, the rest aggregate at the top of the stem, accompanied by a solitary, more slender, barren *catkin*, of a tawny hue. *Scales* all tapering, triangular, rough, dilated at the base. *Stam.* 3, short. *Stigm.* 3, on a long *style*. *Fruit* green, lanceolate, triangular, ribbed, rough-edged, tapering into a short, pointed, deeply cloven *beak*. A few *leaves*, like the *bracteas* but larger, sheath the lower part of the stem. The *fruit* in ripening becomes reflexed. *Seed* small, triangular.

33. *C. limosa*. Green and gold Carex.

Sheaths scarcely any. Fertile catkins ovate, dense, drooping, many-flowered. Fruit elliptical, compressed, ribbed, smooth-edged, without a beak. Root creeping.

C. limosa. *Linn. Sp. Pl.* 1386. *Willd. v. 4.* 293. *Huds.* 409. *Fl. Br.* 986. *Engl. Bot. v. 29. t. 2043.* *Hook. Scot.* 265. *Don H. Br.* 218. *Wahlenb. Lapp.* 242. *Stockh. Trans. for 1803.* 161; excluding the varieties, and the reference to *Schkuhr. Fl. Dan. t. 646. Schk. Car.* 105. *t. X. f. 78.*

C. elegans. *Willd. Berol.* 34. *t. 1. f. 4.*

C. n. 1392. *Hall. Hist. v. 2.* 195.

Cyperoides spicâ pendulâ brevior, squamis e spadiceo vel fusco rutilante, viridibus. *Scheuchz. Agr.* 443. *t. 10. f. 13.*

In deep rotten bogs, or turf pools, rare.

On turf bogs in Yorkshire, Lancashire and Westmoreland. *Hudson.* Near Heydon, Norfolk, in a very deep rotten soil. *Rev. Henry Bryant.* On St. Faith's Newton bogs. *Mr. Woodward.* Cranberry fen, East Winch, Norfolk. *Mr. Crowe.* In various mountain marshes in Scotland. *Rev. Dr. Stuart, Mr. G. Don, &c.*

Perennial. *July.*

Roots creeping very extensively, with long, compound, downy fibres, and sending forth smooth leafy runners, deep into the mud, so that the *flowers* are rarely produced, at least in Norfolk. *Stems* solitary, terminal, ascending, a span long, triangular, striated, roughish, leafy in the lower part. *Leaves* linear, narrow, flat, pointed, a little glaucous, rough-edged, shorter than the stem, enveloped at the base with brown scales. *Bracteas* 1 or 2, erect, taper, brown and membranous, slightly sheathing, at the base. Fertile *catkins* mostly 2, rarely 3, or 1, on long, slender, triangular, smooth stalks, drooping as they ripen, half an inch long, ovate, dense, of many ovate, pointed, close scales, brown, with a golden lustre; the keel broad, green, of many smooth ribs; barren one terminating the stem, erect, linear, of many membranous brown scales. *Stam.* 3. *Stigm.* 3. *Fruit* glaucous-green, smooth, erect, rather longer than the scales,

elliptical, triangular, but greatly compressed, ribbed in its lower half, ending in a very small, entire point, scarcely to be termed a *beak*. Seed brown, triangular, smaller and much less compressed.

34. *C. ustulata*. Scorched Alpine Carex.

Sheaths very short. Fertile catkins ovate, dense, pendulous. Fruit elliptical, compressed, rough-edged, with a cloven beak. Root tufted, somewhat creeping.

C. ustulata. Willd. *Sp. Pl.* v. 4. 293. *Wahlenb. Stockh. Trans.* for 1803. 156. *Lapp.* 238. *Engl. Bot.* v. 34. t. 2404. *Comp. ed.* 4. 152. *Hook. Scot.* 266. *Fl. Dan.* t. 1090.

C. nigra. Allion. *Pedem.* v. 2. 267 ; from the author. Willd. *Sp. Pl.* v. 4. 266.

C. atro-fusca. Schk. *Car.* 106. t. Y. f. 82.

C. limosa. Scop. *Carn.* v. 2. 222 ; by the description.

In wet situations, in a micaceous soil, on the Highland mountains of Scotland.

On Ben Lawers. Mr. G. Don.

Perennial. July.

Root tufted, short and thick, slightly creeping, with copious, shaggy, pale, yellowish, very long fibres, but no runners. Stem 3 or 4 inches high, erect, triangular, smooth, leafy at the bottom only. Leaves short, upright, ribbed, taper-pointed, smooth, except at the edges near the extremity. Catkins 3, all stalked, ovate, of a dark chocolate-colour, as if scorched, each with a small, slightly sheathing, bractea, of nearly the same hue ; the 2 fertile ones pendulous, dense, many-flowered, with ovate, acute, slender-keeled scales. Stam. 3. Stigm. 3. Fruit triangular but compressed, elliptical, dark brown, without ribs ; pale at the base ; rough-edged in the upper part ; ending in a short, broadish, cloven beak.

^ Lapland specimen of this very distinct species was, by Linnæus in his herbarium, mistaken for *C. atrata*, and I have the same, named *atrata*, from Dr. Swartz.

35. *C. atrata*. Black Carex.

Sheaths scarcely any. Catkins uniform, stalked, ovate, drooping ; the terminal one with many barren florets below. Fruit elliptical, compressed, smooth, with a notched beak. Stamens two or three.

C. atrata. Linn. *Sp. Pl.* 1386. Willd. v. 4. 221. *Fl. Br.* 987. *Engl. Bot.* v. 29. t. 2044. *Hook. Scot.* 266. *Dicks. Dr. Pl.* 87. *Wahlenb. Lapp.* 242. *Fl. Dan.* t. 158. Schk. *Car.* 52. t. X. f. 77.

C. n. 1369. *Hall. Hist.* v. 2. 188.

C. alpina, foliis caryophylleis, caule concinnè triquetro, capitulis compactis, pulchellis, atris et tumentibus, spicamque veluti componentibus, ac aliquibus pediculis insidentibus. *Mich. Gen.* 69.

Cyperoides alpinum pulchrum, foliis caryophyllæis, spicis atris et tumentibus. *Scheuchz. Agr.* 481. *t.* 11. *f.* 1, 2.

In alpine pastures, and on rocks.

On rocks in Breadalbane. *Mr. G. Don*. On the Welsh mountains, especially about Llanberris. *Hudson*.

Perennial. *June, July*.

Root tufted, or slightly creeping, with stout perpendicular fibres.

Stem 12 or 15 inches high, erect, triangular, nearly or quite smooth; leafy at the bottom only. *Leaves* shorter than the stem, upright, broad, rough-edged, striated, grass-green; sheathing at the base, with a long abrupt *stipula*. *Bractæas* leafy, with hardly any *sheaths*, but rather a pair of small rounded auricles occasionally. *Catkins* generally four, stalked, uniform, ovate, turgid, black, soon drooping or pendulous, many-flowered; the 3 lowermost fertile, with *stamens* here and there, but rarely, in some *florets* with *pistils*; the terminal one, in its lower half, consisting of barren *florets*. *Scales* of all ovate, acute, of a rusty black, with a narrow, green midrib. *Stam.* often but 2, not uncommonly 3. *Stigm.* 3. *Fruit* elliptical, triangular, compressed, smooth, pale or yellowish, with a short, dark-brown, notched, or slightly cloven, *beak*.

Other species, as *C. pulla* and *ustulata*, appear to have been confounded with this by many continental, as well as British, botanists; and the real *atrata*, larger than any of them, has been arranged with the widely dissimilar tribe of our second section, in spite of its 3 *stigmas*; because of the inferior barren *florets* in one of the *catkins*. That mark indeed keeps it separate from all that resemble it; and if always attended to, would have prevented many mistakes. *Dr. Swartz* mistook *C. atrata* for *saxatilis*; *Linnaeus* appears to have described the true plant in his *Fl. Lapponica*, along with our *ustulata*, which last only he preserved, attaching *pulla* to it as a variety.

36. *C. pulla*. Russet Carex.

Sheaths none. Fertile *catkins* ovate; the lower one stalked. *Fruit* elliptical, slightly inflated, with a short notched *beak*. *Stigmas* two.

C. pulla. *Gooden. Tr. of L. Soc. v. 3.* 78. *t.* 14. *Fl. Br.* 988. *Engl. Bot. v. 29.* *t.* 2045. *Hook. Scot.* 268. *Don H. Br.* 190. *Willd. Sp. Pl. v. 4.* 274. *Schk. Car.* 65. *t. R. f.* 63; copied.

C. fusca. *Schk. Car.* 64. *C, c. f.* 88.

On the Highland mountains of Scotland; *Mr. Dickson*. *Linu. Trans.*

On Ben Lawers. *Mr. J. Mackay*. 1793. *Mr. G. Don* claims the original discovery of this plant on Ben Lomond in 1789; see his *Herb. Brit.*

Perennial. *July*.

Root creeping, with stout fibres. *Stem* nearly upright, about a span high, triangular, striated, the angles roughish near the top only. *Leaves* from the lower part of the stem, nearly as tall, broadish, rough-edged, striated. *Bractea* like them, but smaller, auricled at the base, not sheathing. Fertile *catkins* 2, mostly very unequal; the lower one largest, on a long rough stalk, from the base of the *bractea*, ovate, dense, many-flowered, nearly upright; its *scales* bluntish, of a rusty black; barren one erect, lanceolate, with dark obtuse *scales*. *Stam.* 3. *Stigm.* but 2, by which this species essentially differs from the rest of the alpine ones with black ovate *catkins*, and accords with many more common kinds, hereafter described. *Fruit* spreading, longer than the scales, elliptical, rather compressed, or slightly inflated, smooth, without angles or ribs, of a brownish black; pale at the base; *beak* short, notched.

Schkuhr's *f.* 63 is copied from the Linnæan Transactions, where the middle *catkin*, though present in the original specimen now in my possession, and in all I have seen, is strangely omitted. Hence his *f.* 88 is more correct, and truly excellent.

37. *C. pallescens*. Pale Carex.

Sheaths very short. Fertile catkins cylindrical, stalked; at length pendulous. Fruit obovate, triangular, inflated, smooth, obtuse, with a minute abrupt beak.

C. pallescens. *Linn. Sp. Pl.* 1386. *Willd. v.* 4. 291. *Fl. Br.* 989. *Engl. Bot. v.* 31. *t.* 2185. *Hook. Lond. t.* 178. *Scot.* 266. *Dicks. II. Sicc. fasc.* 4. 16. *Fl. Dan. t.* 1050. *Leers* 203. *t.* 15. *f.* 4. *Schk. Car.* 108. *t.* K, k. *f.* 99. *Rel. Rudb.* 2. *f.* 33. *Ehrh. Phytoph.* 68.

C. n. 1393. *Hall. Hist. v.* 2. 195.

Gramen cyperoides polystachyon flavicans, spicis brevibus, prope summitatem caulis. *Raii Syn.* 419. *Pluk. Almag.* 178. *Phyt. t.* 34. *f.* 5. *Mich. Gen.* 61. *t.* 32. *f.* 13.

In meadows, pastures, and moist shady places, frequent.

Perennial. *May, June*.

Root tufted, fibrous. *Herbage* pale green. *Stems* erect, straight, 12 to 15 inches high, sharply triangular, rough towards the top; leafy at the bottom. *Leaves* about half as tall, erect, flat, striated, a little hairy, roughish at the edges. *Bracteas* leafy, 1 to each catkin; the lowermost largest, rising above the top of the stem, very slightly sheathing at the base. Fertile *catkins* 2 or 3, ovate, or cylindrical, stalked, dense, obtuse, many-flowered,

yellowish green; pendulous when ripe, from half an inch to an inch long; *scales* ovate, pointed, keeled. Barren *catkin* lanceolate, erect, with lanceolate tawny scales. *Stam.* 3. *Stigmas* 3. *Fruit* about the length of the scales, rather obovate, slightly ribbed, smooth, obtuse, equally triangular in the upper part, tipped with a very small, abrupt *beak*, scarcely visibly notched. *Seed* obovate, triangular.

Morison's *sect.* 8, *t.* 12. *f.* 16 is erroneously quoted for this species by Ray, and others who perhaps copied him. The figure represents *C. pilulifera*.

38. *C. flava*. Yellow *Carex*.

Sheaths short, nearly equal to the flower-stalks. Fertile catkins roundish-ovate. Fruit triangular, smooth, with a cloven beak curved downward. Stem nearly smooth.

C. flava. *Linn. Sp. Pl.* 1384. *Willd. v.* 4. 268. *Fl. Br.* 990. *Engl. Bot. v.* 18. *t.* 1294. *Hook. Scot.* 266; omitting the variety. *Dicks. H. Sicc. fasc.* 3. 14. *Fl. Dan. t.* 1047. *Leers* 198. *t.* 15. *f.* 6. *Schk. Car.* 72. *t.* H. *f.* 36.

C. n. 1380. *Hall. Hist. v.* 2. 192.

Gramen palustre echinatum. *Raii Syn.* 421. *Ger. Em.* 17. *f.* *Lob. Ic.* 15. *f.* *Bauh. Hist. v.* 2. 497. *f.* 498.

G. palustre aculeatum germanicum. *Bauh. Pin.* 7. *Theatr.* 109. *f.*

G. cyperoides palustre, aculeatum. *Moris. v.* 3. 243. *sect.* 8. *t.* 12. *f.* 19.

In boggy meadows, frequent.

Perennial. *May, June*.

Root fibrous, tufted, scarcely creeping. *Stem* erect, from 9 to 12 inches high, triangular, smooth, except occasionally near the summit; leafy at the base. *Leaves* bright grass green, erect, various in height, broadish, flat, ribbed, rough at the edges and keel, and marked with 2 prominent rough lines, on the upper side, near the point, as observed by Mr. J. D. Sowerby. *Bracteas* leafy; the upper ones widely spreading, with extremely short *sheaths*; lowermost larger, less spreading, with a longer *sheath*, almost equal to the stalk of the lowest *catkin*. *Catkins* all nearly upright; the barren one lanceolate, not always single, its *scales* light brown, keeled, obtuse, with membranous edges; fertile 2 or 3, ovate or nearly globose, tawny-yellow; the lower one generally stalked; some of them occasionally tipped with a few barren *florets*. *Scales* ovate, acute, tawny, with a broad greenish rib. *Stam.* 3. *Stigm.* 3. *Fruit* green, at length yellow, ovate, or obovate, triangular, turgid, smooth, ribbed, with a smooth-cloven *beak*, more or less remarkably bent downward, and considerably longer than the scales. *Seed* small, triangular, black.

39. *C. Oederi*. Oederian *Carex*.

Sheaths and flower-stalks all very short. Fertile catkins roundish-ovate. Fruit globular, triangular, direct, smooth, with a straight cloven beak. Stem smooth.

C. Oederi, *Ehrh. Calam.* 79. *Engl. Bot.* v. 25. t. 1773. *Comp. ed.* 4. 153.

C. extensa. *Relh.* 367. *Teesd. Tr. of L. Soc.* v. 5. 69.

C. flava β . *Hook. Scot.* 266.

On wet commons, not unfrequent.

Perennial. *July*.

Much smaller than the last; the fruit globular, with a straight beak; the colour of the whole plant less yellow. There appear to be some exotic varieties of *C. flava* that approach it, though the British *flava* always seems distinct enough from our *Oederi*. *Schkuhr's t. F. f.* 26, rather perhaps belongs to *flava*, but Ehrhart's dried specimen accords with our's. I have not studied the subject so as to decide confidently, nor perhaps has any other English botanist.

40. *C. fulva*. Tawny *Carex*.

Sheaths tubular, elongated, shorter than the flower-stalks. Fertile catkins ovate, erect. Scales pointless. Fruit ovate, triangular, direct, smooth, with a straight, cloven, rough-edged beak. Stem rough.

C. fulva. *Gooden. Tr. of Linn. Soc.* v. 2. 177. t. 20. f. 6; but not v. 3. 77. *Fl. Br.* 991. *Engl. Bot.* v. 18. t. 1295. *Hook. Scot.* 266. *Willd. Sp. Pl.* v. 4. 270. *Schk. Car.* 101. t. T. f. 67.

In boggy meadows, not very unfrequent.

Near Eaton, Shropshire. *Rev. E. Williams*. Very common in Mearns-shire, North Britain. *Prof. Beattie*.

Perennial. *June, July*.

More allied to *C. distans*, n. 41, and *speirostachya*, n. 28, than to *flava*. Root creeping. Stem erect, or rather ascending, 12 or 15 inches high, slender; leafy below; triangular, the angles very acute and rough, in the upper part. Leaves upright, flat, lanecolate, sheathing, not half the length of the stem, striated, rough at the edges and keel, but not on the upper side. Bractees leafy, not rising above the stem, with long, close, membranous-edged sheaths, almost equal to the flower-stalks, at least the upper ones; the lowermost stalk being half as long again as its sheath. Fertile catkins 2, rarely 3, considerably distant from each other, upright, ovate, tawny; their stalks triangular, roughish. Scales ovate, obscurely ribbed, pointed, but never awned. Barren catkin mostly single, sometimes 2, cylindrical, erect, acute, of numerous, brown, membranous-edged, obtuse

seales ; a portion of such a *catkin* often terminating 1 or 2 of the fertile ones. *Stam.* 3. *Stigm.* 3, almost sessile. *Fruit* longer than the seales, spreading, straight, ovate, triangular, brownish, smooth, with a shortish, cloven, straight, rough-edged *beak*. *Seed* roundish, triangular, brown, twice the size of either of the two last.

Undoubtedly very distinct from *C. flava*, as well as from *distan*s, with both which it has been occasionally confounded, as well as with *speirostachya*, by British and foreign botanists ; so that the recorded places of growth, of one or the other, are not always to be relied on, any more than the synonyms.

41. *C. extensa*. Long-bracteated *Carex*.

Sheaths and flower-stalks very short. Bracteas very long and spreading. Fertile catkins elliptic-oblong, near together. Scales somewhat awned. Fruit ovate, triangular, with a short, smooth, cloven beak. Stem very smooth.

C. extensa. *Gooden. Tr. of Linn. Soc.* v. 2. 175. t. 21. f. 7; and v. 3. 77. *Fl. Br.* 992. *Engl. Bot.* v. 12. t. 833. *Hook. Scot.* 267. *Willd. Sp. Pl.* v. 4. 268. *Schk. Car.* 74. t. V. f. 72.

C. flava β. *Huds.* 407.

Cyperoides echinatum majus. *Petiv. Conc. Gram.* 6. n. 169. *Dill. in Raii Syn.* 421.

On the sea coast,

On Cley beach, Norfolk, 1776. *Rev. H. Bryant*. Near Harwich, and in the marshy part of Braunton Burrows, Devonshire. *Bishop of Carlisle*. On the coast east of St. Andrews. *Mr. J. Mackay*. Near Rhodipole, Weymouth. *Mr. Groult*.

Perennial. *June*.

Root black, with many stout fibres, tufted, or slightly ereeping. *Stem* generally more or less curved, from 6 to 12 or 18 inches high, bluntly triangular, very smooth throughout ; leafy in the lower part. *Leaves* very long and narrow, channelled, recurved ; rough-edged towards the extremity ; sheathing at the base. *Bracteas* like the leaves, but spreading widely, and eurved rather downward ; angular, furrowed, and very slightly sheathing, at the base. Fertile *catkins* usually 3, near together, erect, roundish or ovate ; sometimes one stands remote from the rest ; and sometimes they are all elongated and cylindrieal. *Flower-stalks* extremely short. *Scales* small, ovate, rusty, the lower ones espeecially tipped with a minute point, or *awn* ; all keeled, and often three-ribbed. *Stam.* 3. *Stigm.* 3. *Fruit* longer than the seales, moderately spreading, ovate, triangular, ribbed, smooth, tapering into a short, straight, smooth, cloven *beak*, not so abrupt at the base as that of *flava*. *Seed* brown, triangular, tumid.

The channelled, narrow, long *leaves* and *bracteas* at once ascertain this species, which is not much allied to *C. flava* or *fulva*. Some fertile *florets* now and then occur in the lower part of the barren *catkin*, which is not always perfectly single.

42. *C. distans*. Loose Carex.

Sheaths tubular, elongated, nearly equal to the flower-stalks. Fertile catkins elliptic-oblong, widely distant. Scales pointed. Stem smooth.

C. distans. Linn. *Sp. Pl.* 1387. Willd. *v.* 4. 271. *Fl. Br.* 992. *Engl. Bot.* *v.* 18. *t.* 1234. Hook. *Scot.* 267. Schk. *Car.* 102. *t.* T. *f.* 68. Ehrh. *Calam.* 40.

C. n. 1382. Hall. *Hist. v.* 2. 192.

Cyperoides spicis parvis, longè distantibus. Segu. *Veron. v.* 3. 77; from the author. Scheuchz. *Agr.* 431.

Gramen cyperoides, spicis parvis longissimè distantibus. Raii *Syn.* 420.

G. cyperoides gracile alterum, glomeratis torulis, spatio distantibus. Lob. *Illustr.* 60. Moris. *v.* 3. 243. *sect.* 8. *t.* 12. *f.* 18.

In muddy marshes, especially near the sea; first noticed by Dr. Martin Lister, according to Ray.

Perennial. June.

Root fibrous, scarcely creeping. Stem 12 to 18 inches high, weak, or reclining, triangular, striated, smooth, except at the very summit above the fertile catkins; leafy at the bottom. Leaves lanceolate, flat, short and broad, tapering to a point, rough at the edges. Bracteas narrower than the leaves, each with a close, striated, cylindrical, smooth sheath, about an inch long. Flower-stalks sometimes entirely inclosed in the sheaths, but the lowermost are generally longer, triangular and smooth. Fertile catkins 2 or 3, with a space of 6 inches, or more, between the 2 lowest, all usually elliptic-oblong, various in length if not in thickness, erect, blackish or brown rather than tawny. Scales ovate, broad, brown speckled with red, having a green 3-ribbed keel, and a very distinct, straight, rough point, or awn, varying in length, but always sufficient to distinguish the present species from its allies, except the following. Barren catkin always solitary, erect, cylindrical, obtuse, longer than the rest; its scales numerous, obtuse, pointless, rusty. Stam. 3. Stigm. 3. Fruit ovate, triangular, uniformly and equally ribbed all over, either rough or smooth at the edges of the upper part, in the very same catkin, as are likewise the edges of the shortish cloven beak, though all are usually smooth. Schkuhr represents them always rough, though his figure is otherwise very good. Seed obscurely dotted, triangular, equal.

The plate of *Fl. Dan. t.* 1029, quoted in *Fl. Br.*, is indubitably our *C. speirostachya*, *n.* 28. to which species, I have reason to

apprehend, some of the reported places of growth of *C. distans* belong.

43. *C. binervis*. Green-ribbed Carex.

Sheaths tubular, elongated, shorter than the flower-stalks.

Fertile catkins cylindrical, distant; partly compound.

Scales pointed. Stem smooth. Fruit with two principal ribs.

C. binervis. Sm. *Tr. of L. Soc.* v. 5. 268. *Fl. Br.* 993. *Engl. Bot.* v. 18. t. 1235. *Willd. Sp. Pl.* v. 4. 271. "Schk. *Car. t. R.* r, r. f. 160;" *Willd.*

C. distans. *Lightf.* 561.

On dry heaths, in various parts of Britain.

Very common on the driest moors about Aberdeen. *Prof. Beattie.*

Near Edinburgh. *Mr. J. Mackay.* Near Rippon. *Mr. J. Brunton.*

Perennial. *June.*

Nearly twice the size of the last, notwithstanding its much more dry and barren place of growth. *Stem* erect, firm, from $1\frac{1}{2}$ to near 3 feet high, bluntly triangular, and smooth, except at the very top, where the angles are sharp and partly rough. *Leaves* erect, flat, broadish, taper-pointed, ribbed, of a deep, though glaucous, green; rough at the edges, and partially so at the keel; very rough at the triangular point; their *sheaths* smooth, about half the length of the leaf itself, or more. *Bractees* like the leaves, but smaller and narrower, with smooth *sheaths* of about the same proportion; the upper one short, though equal to the adjoining *flower-stalk*. The other *flower-stalks* are longer than their sheaths, all triangular and roughish. Fertile *catkins* 3 at least, the 2 lowermost not above 3 or 4 inches asunder, in which they accord with the usual proportion of other species, not with *C. distans*; all cylindrical, erect, blackish; often divided, or slightly compound, at the base; often consisting of barren *florets*, for nearly half their length, at their summits. *Scales* like those of the last, with similar rough awns. Barren *catkin* mostly solitary, erect, above an inch long, cylindrical, dense; its *scales* very numerous, pointless, dark brown, with a pale keel; but there are often a few barren *florets* at the point of several fertile *catkins*. *Stam.* 3. *Stigm.* 3. *Fruit* ovate, unequally triangular, a little compressed, smooth, with a short, broad, deeply cloven, scarcely rough-edged, *beak*; the *inner* surface concave, paler, streaked with several equal purplish ribs; *outer* convex, paler, with a central prominent angle or keel, and 2 very distinct, elevated, smooth, green ribs towards the margin, though totally distinct from it, found perhaps in some other species, quite unlike this, but not in any which, properly examined, can be confounded with it, especially *C. distans*.

My copy of Schkuhr's *Carices* goes no further than *t. D, d, d*, so that I cannot verify Willdenow's reference to that admirable and most correct work. Wahlenberg's *C. binervis*, *Stockh. Trans. for 1803. 157*, is our *speirostachya*, *n. 28*, he having been misled by a specimen of the latter, which was not then known in England.

44. *C. præcox*. Vernal Carex.

Sheaths about equal to the very short flower-stalks. Catkins all elliptical, rather crowded. Scales of the fertile ones pointed. Fruit pear-shaped, downy, with an abrupt entire point.

C. præcox. *Jacq. Austr. t. 416. Willd. Sp. Pl. v. 4. 262. Gooden. Tr. of L. Soc. v. 2. 170. Fl. Br. 994. Engl. Bot. v. 16. t. 1099. Hook. Scot. 267. Lond. t. 22. Relh. ed. 2. 367. Schk. Car. 63. t. F. f. 27.*

C. saxatilis. *Huds. 408.*

C. montana. *Lightf. 551; not of Hudson.*

C. filiformis. *Leers 200. t. 16. f. 5.*

C. stolonifera. *Ehrh. Calam. 99.*

C. n. 1381. Hall. Hist. v. 2. 192; without any doubt.

Gramen cyperoides vernum minimum. Raii Syn. 421.

G. cyperoides spicatum. Ger. Em. 22. f.

G. cyperoides spicatum, foliis caryophylleis. Moris. v. 3. 243. sect. 8. t. 12. f. 11.

G. spicatum, foliis Veronicæ caryophyllatæ. Lob. Ic. 10. f.

Cyperoides vernum, caule rotundo-triquetro, spicis seminalibus densioribus, binis, vel ternis, squamis ferrugineis, obtusè mucronatis, et tamquam in aristulam prolongatis, capsulis turbinatis subhirsutis trilateris. Mich. Gen. 64. n. 70. Segn. Veron. v. 1. 122. t. 1. f. 3.

On dry heaths and hillocks, and in open barren pastures, very abundant.

Perennial. *April.*

Root branched, creeping, with several procumbent leafy shoots.

Stem ascending obliquely, from 3 to 6 or 8 inches high, firm, triangular, smooth; leafy at the base only. *Leaves* several, forming close tufts, short, harsh, spreading, or recurved, pointed, keeled, flattish, ribbed; rough at the edges, points and ribs; their colour rather glaucous, and pink-like. *Bractees* short, very narrow, erect, often wanting; their *sheaths* tubular, though short and abrupt, dilated upwards. *Flower-stalks* hardly reaching beyond the sheaths. Fertile *catkins* generally 2, near together, erect, elliptic-oblong, dense, but not many-flowered; their *scales* ovate, brown, with a green rib, and small point. Barren *catkin* solitary, longest, elliptic-oblong, rather obtuse and club-shaped, with blunt, rusty, pale-ribbed *scales. Stam. 3.*

Stigm. 3. *Fruit* obliquely pearshaped, all over finely downy, green, with a very short, conical, abrupt, entire, brown tip. *Seed* triangular, rather flattened, polished, purplish brown.

This common *Carex*, so conspicuous in the spring, with its numerous sulphur-coloured anthers, has had many names, being totally unlike Schreber's *C. præcox*, for which Jacquin mistook it, misled as it should seem by the very wrong reference to Seguier, whose plant is our's. The other is now *C. Schreberi*, Willd. v. 4. 225, and is Haller's n. 1367, belonging to our second section, but not yet found in Britain.

45. *C. pilulifera*. Round-headed *Carex*.

Sheaths none. Fertile catkins two or three, sessile, crowded, almost globular, with pointed scales. *Fruit* triangular, roundish, downy, with a short, cloven beak.

C. pilulifera. Linn. *Sp. Pl.* 1385. Willd. v. 4. 259. *Car. Berol.* 24. t. 2. f. 2. *Fl. Br.* 995. *Engl. Bot.* v. 13. t. 885. *Hook. Scot.* 267. *Dicks. H. Sicc. fasc.* 9. 12. *Don H. Brit.* 191. *Schk. Car.* 78. t. 1. f. 39.

C. montana. Linn. *Sp. Pl.* 1385. *Huds.* 407.

C. filiformis. *Fl. Dan.* t. 1048.

C. decumbens. *Ehrh. Calam.* 70.

Gramen cyperoides, spicis brevibus congestis, folio molli. Raii *Syn. ed.* 2. 267. *ed.* 3. 421.

G. cyperoides tenuifolium, spicis ad summum caulem sessilibus globulorum æmulis. Pluk. *Almag.* 178. *Phyt. t.* 91. f. 8. Raii *Syn. ed.* 2. app. 345. *ed.* 3. 422.

On heaths, especially in boggy spots, frequent.

Perennial. *April, May.*

Root of numerous shaggy fibres, tufted, scarcely creeping. *Stems* mostly recumbent, curved, weak, slender, triangular, smooth, except at the top, naked, from 9 to 12 inches high. *Leaves* all radical, or nearly so, tufted, pliant, erect, grassy, bright green, rough at the edges and keel, longer and much narrower than in the last, much shorter than the stem, except, as Willdenow remarks, those which last through the winter. *Bractees* awl-shaped, slender, smoothish, the lower one only rising above the adjoining catkin, all of them quite destitute of *sheaths*, though dilated at the base. Fertile *catkins* 2 or 3, seldom 4, sessile, near together, spreading, globular, dense, with ovate, mostly bristle-pointed, *scales*; barren one erect, quite solitary and distinct, lanceolate, acute, with rusty, lanceolate, white-edged scales. *Stam.* 3. *Stigm.* 3. *Fruit* roundish-ovate, triangular, all over densely downy, green, with a short brown *beak*, acute and cloven at the summit. *Seed* yellowish, almost globular, with 3 slight angles.

Ray admitted this species into the appendix of his 2d edition, after Pctiver, though he had already described it, from Doody's spe-

cimens, in *p.* 267 of the same work ; so Dillenius has it twice over in the 3d edition.—Linnæus, in like manner, adopted it from Plukenet's figure alone, while he described at the same time a specimen of the same, by the name of *montana*. That of *pilulifera* has been generally retained. It alludes to the globular shape of the *catkins*, *globulorum æmulis*, and not to the fruit.

46. *C. tomentosa*. Larger Downy-fruited Carex.

Sheaths extremely short. Fertile catkins one or two, nearly sessile, cylindrical, obtuse, with acute scales. Fruit globose, slightly triangular, densely downy, with a short, cloven beak.

C. tomentosa. Linn. *Mant.* 123. Willd. *Sp. Pl.* v. 4. 263. Sm. *Tr. of L. Soc.* v. 5. 269. Fl. Br. 996. Engl. Bot. v. 29. t. 2046. Dicks. *Dr. Pl.* 43. Fl. Dan. t. 1404. Leers 200. t. 15. f. 7. Schk. *Car.* 69. t. F. f. 28.

C. sphærocarpa. Ehrh. *Calam.* 89.

C. n. 1373. Hall. *Hist.* v. 2. 190.

Cyperoides angustifolium montanum, folliculis seminum villosis Scheuchz. *Agr.* 423.

In meadows in the south of England, very rare.

Near Merston Measey, Wiltshire. Mr. R. Teesdale.

Perennial. June.

Root creeping, with scaly shoots, and long shaggy fibres ; the scales, as well as those that envelop the leaves and stems at the base, of a deep blood-red brown. Stems erect, a foot or more in height, with 3 sharp angles rough upwards ; leafy at the bottom only. Leaves of the present year not one third the height of the stem, erect, acute, flat, grass-green, somewhat hairy, rough-edged, ribbed. Bractæas leafy, scarcely rising above the stem ; the sheath of the lowermost extremely short ; of the rest hardly any. Fertile catkins commonly 2, often one only, nearly or quite sessile, dense, erect, oblong, obtuse ; the lowermost cylindrical, seldom an inch long ; the rest shorter, elliptical, but never so crowded, rounded, or spreading as in *C. pilulifera* ; their scales ovate, broad, acute, brown, with a dilated, pale midrib. Barren catkin longest, lanceolate, tumid, erect, with pale, rusty, obtuse scales ; its upper half very rarely composed of fertile florets ; but it is usually quite solitary and distinct. Stam. 3. Stigm. 3, sessile. Fruit globular, with 3 very slight, brown angles, a little flattened, green, clothed with copious whitish down, longer and more abundant than in the foregoing, turning tawny by keeping ; beak very short and thick, erect, deeply cloven. Seed pale, obscurely triangular.

47. *C. panicea*. Pink-leaved *Carex*.

Sheaths elongated, about half the length of the flower-stalks. Fertile catkins one or two, distant; lower one rather lax. Fruit tumid, smooth, cloven at the summit. Stem smooth, obtusely triangular.

C. panicea. Linn. *Sp. Pl.* 1387. Willd. v. 4. 280. *Fl. Br.* 998. *Engl. Bot.* v. 21. t. 1505. Hook. *Scot.* 267. *Rel. Rudb.* 2. f. 31. *Fl. Dan.* t. 261. Leers 203. t. 15. f. 5. Schk. *Car.* 110. t. L. 1. f. 100. Ehrh. *Calam.* 80.

C. n. 1405. Hall. *Hist.* v. 2. 199.

Cyperoides foliis caryophylleis, caule rotundo-triquetro, spicis e rarioribus et tumidioribus vesicis compositis. Mich. *Gen.* 61. t. 32. f. 11.

Gramen cyperoides foliis caryophylleis, spicis e rarioribus et tumidioribus granis compositis. Raii *Syn.* 418. Pluk. *Almag.* 178. *Phyt.* t. 91. f. 7.

In meadows and moist pastures.

Perennial. May, June.

- *Root* creeping. *Stems* about a foot high, upright, striated, smooth, with 3 blunt angles. *Leaves* chiefly towards the root, glaucous, rough-edged, flat, erect, half the height of the stem; their keel smooth, except near the summit. *Bracteas* erect, leafy, with long pale *sheaths*. Fertile *catkins* usually two, about an inch long, erect, rather distant, linear; the lowermost lax and elongated, especially in its lower part, standing on a slender triangular *stalk*, twice as long as the *sheath*; the upper one more dense, with a shorter *stalk*, and smaller *bractea*. *Scales* ovate, acute, dark-brown, with a narrow white edge and green keel. Barren *catkin* for the most part solitary, lanceolate, acute, dense, with dark-brown, elliptic-lanceolate *scales*. *Stam.* 3. *Stigm.* 3, nearly sessile. *Fruit* green or yellowish, smooth, ovate, or obovate, ribbed, inflated, longer than the scales, bluntish, without a beak, but terminating in 2 small teeth. *Seed* short, triangular, brown, very frequently infested with *ustilago* or smut, by which it swells and turns into a sooty powder.

The herbage, when young, much resembles *C. recurva*, but the characters of the two species differ essentially.

48. *C. recurva*. Glaucous Heath *Carex*.

Sheaths short. Fertile catkins two or three, cylindrical, dense, drooping, on very long recurved stalks. Fruit elliptical, triangular, roughish, obtuse, slightly notched.

C. recurva. Huds. 413. Gooden. *Tr. of L. Soc.* v. 2. 184. Willd. *Sp. Pl.* v. 4. 298. *Fl. Br.* 999. *Engl. Bot.* v. 21. t. 1506. Hook. *Scot.* 268. *Fl. Dan.* t. 1051.

- C. glauca.* Scop. Carn. v. 2. 223. Pollich v. 2. 594.
C. flacca. Schreb. Lips. append. n. 669. Schk. Car. 117. t. O, P. f. 57.
Wahlenb. Stockh. Trans. for 1803. 160. Ehrh. Phytoph. 98.
C. pendula. Schreb. Lips. 62.
C. limosa β . Leers 201. t. 15. f. 3!
C. n. 1408. Hall. Hist. v. 2. 200; with confused references. *N.* 1407 of this author is presumed to be the same.
Cyperoides palustre, spicis purpurco-spadiceis, tenuibus pediculis insidentibus. Scheuchz. Agr. 467.
Gramen cyperoides, foliis caryophylleis, spicis oblongis, e pediculis longioribus pendulis. Raii Syn. 418.
G. cyperoides nemorosum, spicâ subnigrâ recurvâ. Moris. sect. 8. t. 12. f. 14. But not of Bauh. Theatr. 98; nor is Morison's own definition, v. 3. 243. n. 14, correct.
 β . *Carex Micheliana.* Sm. Tr. of L. Soc. v. 5. 270. Fl. Br. 1004. Engl. Bot. v. 32. t. 2236.
C. ambleocarpa. Willd. Sp. Pl. v. 4. 307.
Cyperoides foliis caryophylleis, caule exquisitè triangulari, spicis habitioribus, squamis curtis, obtusè mucronatis, capsulis turbinatis brevibus confertis. Mich. Gen. 62. t. 32. f. 12.

In moist meadows, pastures, groves, and wet barren heathy ground, common.

Perennial. May, June.

Root creeping, sheathed with purplish-brown scales. *Herbage* glaucous, very conspicuous in moist as well as dry weather. *Stem* erect, from 8 to 18 inches high, roundish with 3 angles, scarcely rough in any part. *Leaves* mostly radical, upright, or partly recurved, broad, acute, rough-edged, not half so tall as the stem, much resembling the foliage of pinks or carnations. *Bractees* leafy, the lowermost several inches long; their *sheaths* short, crowned with rounded brown *auricles*. *Fertile catkins* 2, often 3, cylindrical, obtuse, many-flowered, very dense, drooping as they ripen, and at length pendulous, each on a slender smooth *stalk*, many times longer than its *sheath*. *Scales* ovate, more or less acute; bluntish and entirely pointless, in the variety β ; their colour like chocolate, with a greenish rib. *Barren catkin* generally solitary, but very often accompanied by a smaller one, and the upper portion of several of the fertile *catkins* frequently consists of barren *florets*; β is remarkable for having 4 completely barren *catkins*, with half another; though only one, compound at the base, consisting entirely of fertile *florets*. *Scales* of the barren *catkins* usually obovate and obtuse, dark-brown with a yellow rib; sometimes they are partly acute, and even pointed. *Stam.* 3. *Stigm.* 3, on a short *style*. *Fruit* elliptical, or somewhat obovate, obtuse, bluntly triangular, tumid, more or less downy or rough, of a rusty green, soon becoming black, destitute of a beak, though obscurely cloven. *Seed* short, triangular, dark-brown with pale angles.

β has smooth *fruit*, which in this case appears to constitute no specific difference.

By the description this is shown to be a very variable species.

Yet it is not the only one which varies in the number of the barren *catkins*, or in having some barren *florets* at the top of the fertile *catkins*, which latter circumstance occurs in the last described.

With regard to its name, the *Carex* in question has been unfortunate. It was first called *flacca* by Schreber, and in the year following, *glauca* by Scopoli. Hudson ought to have retained one of these, had he been informed of them, when he first described the plant in his 2nd edition; but he took the appellation of *recurva* from Morison's synonym. I might now perhaps have attempted to restore *flacca*, as most prevalent on the continent; but as Willdenow has sanctioned *recurva*, and he is one of the best writers upon this genus, this name, being in itself unexceptionable, may as well remain.

49. *C. rigida*. Rigid *Carex*.

Stigmas two. Sheaths none. Fertile catkins ovate; the lowermost stalked. Bractees lanceolate, recurved, as well as the leaves. Fruit triangular, somewhat compressed, with a short abrupt beak.

C. rigida. Gooden. *Tr. of L. Soc.* v. 2. 193. t. 22. f. 10. Willd. *Sp. Pl.* v. 4. 273. Fl. Br. 997. Engl. Bot. v. 29. t. 2047. Don. H. Br. 217.

C. cæspitosa β . Hook. *Scot.* 268.

C. saxatilis. Fl. Dan. t. 159. Willd. *Sp. Pl.* v. 4. 272. Schk. *Car.* 54. t. I. and T, t. f. 40. But by no means that of Linnæus, which is more allied to *C. pulla*, n. 36.

C. fusca. Allion. *Pedem.* v. 2. 369. Davall.

C. mucronata. Jacq. *Ms.*

C. n. 1378. Hall. *Hist.* v. 2. 191.

Cyperoides germanicum, foliis brevibus rigidis acutis, caule rotundo-triquetro, spicis parvis, squamis obtusè mucronatis, capsulis oblongis turbinatis, in angustum et longiusculum apicem attenuatis. Mich. *Gen.* 61. t. 32. f. 4, not 16.

On the exposed tops of the most lofty mountains.

On the summit of Snowdon. Mr. Hudson. Found on the top of Ben Lomond in 1782.—It has since been observed, by Mr. Dickson and Mr. J. Mackay on the summits of several of the Highland mountains abundantly; and on the Cheviot hills by Mr. Winch.

Perennial. June, July.

Roots stout and woody, creeping widely by means of scaly branching runners, with strong, thick, downy fibres. Whole plant

remarkably firm and rigid. *Stems* solitary, mostly curved, sometimes erect, from 3 to 6 inches high, triangular, striated, leafless, except at the base; the angles smooth in their lower part, rough upwards. *Leaves* numerous, shorter than the stems, more or less recurved, linear-lanceolate, pointed, flat, broader than in most of the neighbouring species, rough at the edges and keel, slightly glaucous; their *sheaths* permanent, closely crowded, strongly ribbed, becoming bleached, and polished, embracing each other. *Bracteas* leafy, lanceolate, recurved, about an inch long; the upper ones minute; *sheaths* none, though there are generally two rounded brown *auricles* at the insertion of each bractea. Fertile *catkins* 2 or 3, ovate-oblong, obtuse, dense; the uppermost nearly or quite sessile, close together at the foot of the barren one; the lowermost at a little distance, on a *stalk* half its own length, erect. *Scales* elliptic-oblong, obtuse, pointless, dark-brown, with a pale yellowish rib. Barren *catkin* mostly solitary, thick, obtuse, with rusty, obtuse, torn scales. *Stam.* 3. *Stigm.* only 2, nearly sessile. *Fruit* crowded, elliptical, moderately compressed, obscurely triangular, smooth, ribless, longer than the scales, pale green, the exposed part brown; the summit tipped with a very short, blackish, cylindrical, abrupt, entire *beak*, often scarcely discernible. Micheli exhibits the occasionally recurved point of the *fruit*, noticed by the Bishop of Carlisle.

The above synonyms evince that this species has not remained unknown to foreign botanists, and that none of them ever thought of confounding it with *C. cæspitosa*. Many have indeed mistaken it for *saxatilis*, which the Linnæan herbærium shows to be totally different. After such authorities as Mr. Hudson, Mr. Dickson and the learned Bishop of Carlisle, my own opinion in support of this species, formed when I gathered it 45 years since, and now confirmed, is perhaps superfluous; nor do I insist upon it from any disrespect for my valued friend Dr. Hooker.

50. *C. cæspitosa*. Tufted Bog Carex.

Stigmas two. *Sheaths* none. Fertile *catkins* cylindrical, obtuse, erect; the lowermost rarely stalked. *Leaves*, and auricled *bracteas*, linear, erect. *Fruit* permanent, elliptical, flat, many-ribbed, with a very short abrupt *beak*.

C. cæspitosa. Linn. *Sp. Pl.* 1388. Willd. v. 4. 287. *Fl. Br.* 100. *Engl. Bot.* v. 21. t. 1507. Gooden. *Tr. of L. Soc.* v. 2. 195. t. 21. f. 8. Hook. *Scot.* 268. Schk. *Car.* 57. t. A, a, and B, b. f. 85. Ehrh. *Calam.* 130.

Gramen caryophylleum, angustissimis foliis, spicis sessilibus bre-

vioribus erectis non compactis. *Moris. v. 3. 243. Dill. in Raii Syn. 418.*

In marshes, and wet shady places, not rare.

Perennial. *May, June.*

Root creeping, but short, composing dense entangled tufts, which gradually become firm, so as to be walked upon, like *C. paniculata*, n. 20; and not at all resembling the long straggling roots of *C. rigida*. The plant is well known in Sweden for its property of filling up boggy ground, changing it to green meadows, of which Linnæus gives a remarkable account, *Fl. Suec. ed. 2. 333. Stems* erect, from 6 to 12 inches, or more, in height, leafless except at the bottom, triangular, striated; the angles rough in the upper part only. *Leaves* numerous, shorter than the stems, quite straight and upright, soft and flexible, linear, acute, bright-green, scarcely glaucous, rough at the edges and keel, about one third the breadth of the foregoing; their *sheaths* less remarkably permanent, of a dark red brown. *Bractæas* leafy, erect, narrow and tapering, from 1 to 3, or even 6 inches in length; without any *sheaths*, but accompanied at the base by a pair of rounded, short, dark-brown *auricles*, very variable in size, but never elongated. Fertile *catkins* almost invariably 3, sessile, a little distant, erect, cylindrical, obtuse, dense and thick, an inch long, seldom so shortened as to become ovate; the lowermost, in some foreign specimens at least, very lax in its lower part, and supported by a long slender stalk. *Scales* obovate, obtuse, black, with a narrow green rib. Barren *catkin* mostly single, rarely accompanied by a small one at a little distance, erect, lanceolate, acute, about an inch long, formed of numerous, crowded, obtuse, dark-brown *scales*. *Stam. 3. Stigm. 2*, nearly sessile. *Fruit* longer than the scales, elliptical, broad, compressed almost flat, green, smooth, ribbed on both sides, having no central longitudinal angle at the inner side, so as to be even bluntly triangular, but instead of it there is a double keel, or thickened margin, at one of the edges. This affords of itself an essential difference from the last. *Beak* extremely short, brownish, abrupt, or minutely cloven. *Seed* compressed. The *fruit* is observed by the Bishop of Carlisle to remain on the stalk till it is quite ripe, and even decayed, which is not the case with the following. It is usually set in 6 rows, rarely in 8.

51. *C. stricta*. Glaucous straight-leaved Carex.

Stigmas two. *Sheaths* none. Fertile *catkins* nearly sessile, erect, cylindrical, elongated, acute; often barren-flowered at the top. Bases of the leaves reticulated.

Fruit elliptical, flat, with a short cloven beak, deciduous.

C. stricta. Gooden. Tr. of L. Soc. v. 2. 196. t. 21. f. 9. Fl. Br. 1000.

Engl. Bot. v. 13. t. 914. *Hook. Scot.* 268. *Willd. Sp. Pl.* v. 4. 287. *Schk. Car.* 60. t. V. f. 73. *Don H. Br.* 192.

C. cæspitosa. *Huds.* 412. *Lightf.* 561, β .

C. n. 1400. *Hall. Hist.* v. 2. 198.

Gramen cyperoides, foliis caryophylleis, spicis erectis sessilibus, e seminibus confertis compositis. *Raii Syn.* 418.

G. cyperoides palustre, spicâ pendulâ. *Loes. Pruss.* 116. t. 30 ?

In marshes, not uncommon.

Perennial. *April.*

Twice the size of the foregoing, with more of a glaucous hue.

Root creeping. *Stems* erect, from $1\frac{1}{2}$ to 2 feet high, acutely triangular, rough towards the top. *Leaves* erect, shorter than the stems, the lower ones membranous, torn and reticulated at the edge of their sheaths, which soon splits into entangled threads, forming a kind of loose network. *Bracteas* leafy, erect, taper-pointed ; the upper ones very small, somewhat dilated and membranous at the edges, but without the dark rounded auricles of *C. cæspitosa*. Fertile *catkins* from $1\frac{1}{2}$ to 2 inches long, all nearly or quite sessile, always upright, cylindrical, dense and many-flowered, most of them pointed, having more or less of their upper part composed of barren *florets*. *Scales* obtuse, dark-brown, with a green rib. Barren *catkins* often 2, besides the above-mentioned portions of the fertile ones, an inch or two in length, with innumerable, obtuse, dark-brown *scales*. *Stam.* 3. *Stigm.* 2, with a *style* nearly their own length. *Fruit* like the preceding, but in 8 rows, rather more tapering into its short notched *beak*, and falling off as soon as it is well ripe. *Seed* orbicular, compressed.

Mr. Davall observes that *C. stricta*, by means of its matted *roots*, forms islands in the Swiss lakes or pools, probably like the tufts of *C. cæspitosa*, on a larger scale.

***** *Barren and fertile florets in separate catkins. Barren catkins two or more.*

52. *C. acuta.* Slender-spiked Carex.

Stigmas two. *Catkins* cylindrical, slender ; drooping in flower ; afterwards erect. *Fruit* elliptical, with a blunt undivided *beak*.

C. acuta. *Linn. Sp. Pl.* 1388. *Fl. Suec. ed.* 2. 334 β . *Willd. v.* 4. 304. *Fl. Br.* 1001. *Engl. Bot. v.* 9. t. 580. *Hook. Scot.* 269. *Gooden. Tr. of L. Soc. v.* 2. 203. *Dicks. H. Sicc. fasc.* 11. 15. *Leers* 204. t. 16. f. 1. *Schk. Car.* 61. t. E, e, F, f. 92. " *Host Gram. v.* 1. 70. t. 95." *Ehrh. Calam.* 49.

C. gracilis. *Curt. Lond. fasc.* 4. t. 62.

C. n. 1406. *Hall. Hist.* v. 2. 199.

Gramen cyperoides majus angustifolium. *Raii Syn.* 417.

In watery meadows, about ditches and pools, common.

Perennial. *May*.

Root creeping extensively, with whitish horizontal runners, very difficult of extirpation. *Stems* commonly 2 or 3 feet in height, in a starved state sometimes but 3 or 4 inches, having 3 rough angles; drooping at the summit while in flower only, but subsequently quite erect. *Leaves* sheathing the base of the stem in three rows, of a bright deep green, not glaucous, upright, drooping at the extremity, shorter than the stems, rough at the edges and keel. *Bracteas* leafy, tapering, without *sheaths*, though often minutely auricled; the first or second overtopping the stem. Fertile *catkins* 3 or 4, nearly, if not quite, sessile, except the lowermost, all a little inclining while in flower, cylindrical, slender, $1\frac{1}{2}$ or 2 inches long, dense, many-flowered, commonly with a few barren *florets* at the summit. *Scales* lanceolate, acute, black, with a pale rib. Completely barren *catkins* 2 or 3, about the size of the fertile ones, with lanceolate, bluntish, dark *scales*. *Stam.* 3. *Stigm.* never more than 2, by which, as the Bishop of Carlisle and Mr. Curtis long since remarked, this species is infallibly known from the two following, though Linnæus and many others have confounded them. *Fruit* for the most part shorter than the scales, elliptical, obtuse, compressed, ribbed, smooth, green, with partial stains of brown, deciduous; *beak* short, cylindrical, abrupt, entire. *Seed* small, obovate, compressed, not triangular.

Linnæus, having quoted, with commendation, for this *Carex* Micheli's *t.* 32. *f.* 12, which has no character in common with it, except the numerous barren *catkins*, and which really belongs to *C. recurva*, *n.* 48, some of the most able botanists have been led into error by that means.

53. *C. paludosa*. Lesser Common Carex.

Stigmas three. Catkins cylindrical, bluntish, erect; the fertile ones with taper-pointed scales. Fruit ovate, triangular, compressed, with a notched beak.

C. paludosa. Gooden. *Tr. of L. Soc.* v. 2. 202. Willd. *Sp. Pl.* v. 4. 305. *Fl. Br.* 1002. *Engl. Bot.* v. 12. *t.* 807. Hook. *Scot.* 269. Schk. *Car.* 121. *t.* O, o, *f.* 103. "*Host Gram.* v. 1. 68. *t.* 92."

C. acuta. Curt. *Lond. fasc.* 4. *t.* 61; omitting the references to *Scopoli* and *Micheli*.

C. acutiformis. Ehrh. *Calam.* 30.

Gramen cyperoides minus angustifolium. Dill. in *Raii Syn.* 418.

In boggy meadows, and about the margins of ditches, pools and rivers, common.

Perennial. *May*.

Root creeping, like the foregoing, from which this species differs in its rather larger size, glaucous hue, erect posture, and most

essentially by having constantly 3 *stigmas*. *Stem* with 3 very rough angles, whose interstices are unequal. *Leaves* broadish, erect; rough at the edges and keel. *Bracteas* without *sheaths*, and seldom auricled; the lowermost large, rising above the stem. *Catkins* all cylindrical and bluntish, erect, slightly stalked; the barren ones generally 3; fertile about as many, often barren-flowered at the top. *Scales* of the former oblong, obtuse, of a shining brown, with a green keel; of the fertile ones lanceolate, acute, commonly tipped with a brown rough point, or awn. *Fruit* crowded, ovate, triangular though much compressed, green, smooth, strongly and copiously ribbed, rather longer than the scales, with a short, acute, more or less deeply cloven, *beak*. *Seed* triangular.

54. *C. riparia*. Great Common *Carex*.

Stigmas three. *Catkins* erect, with taper-pointed scales. *Fruit* ovate, tumid, with a deeply-cloven beak.

C. riparia. *Curt. Lond. fasc. 4. t. 60.* *Gooden. Tr. of L. Soc. v. 2. 200.* *Willd. Sp. Pl. v. 4. 306.* *Fl. Br. 1003.* *Engl. Bot. v. 9. t. 579.* *Hook. Scot. 269.* *Schk. Car. 122. t. Q, q. f. o. t. R, r. f. 105.*

C. acuta. *Huds. 413.* *Lightf. 565.*

C. crassa. *Ehrh. Calam. 59.* "*Host Gram. v. 1. 68. t. 93.*"

C. vesicaria β and γ . *Leers 205. t. 16. f. 2, I and II.*

Cyperoides aquaticum maximum, foliis vix unciam latis, caule exquisitè triangulari, spicis habitioribus erectis, squamis in aristam longiùs productis, capsulis oblongis, bifidis. *Mich. Gen. 57. n. 10. t. 32. f. 7; also n. 11. f. 6.*

Gramen cyperoides cum paniculis nigris. *Raii Syn. 417.* *Bauh. Hist. v. 2. 494. f.*

G. cyperoides latifolium, spicâ rufâ, sive caule triangulo. *Bauh. Pin. 6*, with very doubtful synonyms. *Theatr. 83. f. Moris. v. 3. 242. sect. 8. t. 12. f. 1.*

In watery places, especially in the reedy margins of rivers, abundantly.

Perennial. *April, May.*

The largest and stoutest of our *Carices*, distinguished from every variety of *cæspitosa*, *stricta* and *acuta* by its 3 *stigmas*, and from *paludosa* by its pointed, triangular, barren *catkins*, as well as its darker, less glaucous, herbage, tumid *fruit*, and pointed *scales* of both kinds of *catkins*. From all these species it differs in its greater size.

The *root* is thick and long, creeping extensively. *Stem* a yard or more in height, erect, firm, with 3 sharp, very rough angles. *Leaves* broad, upright, rough at the edges and keel, deep green, with very little of a glaucous hue. *Bracteas* like them, rising above the stem, with very short *sheaths*, and pale rounded au-

ricles, not always present. Barren *catkins* from 3 to 5, crowded, triangular, sharp-pointed; their *scales* lanceolate, taper-pointed, more or less awned, strongly keeled, of a uniform dark-brown, rather downy. Fertile *catkins* 3 or 4, erect, stalked, thick, cylindrical, pointed, especially when tipped with a few barren *florets*; their *scales* ovate, smooth, tapering into a long, sharp, rough, awn. *Stam.* 3. *Stigm.* 3. *Fruit* ovate, triangular, pale brown, smooth, finely ribbed, tumid, inflated, not compressed like the last, terminating in a broad, shortish, deeply cloven *beak*, with 2 sharp distant points. *Seeds* small, whitish, triangular.

Haller's *n.* 1404 is commonly taken for this plant, and it is possible he might have had it in view, along with some of our last-described, under that number, as well as under his 1398 and 1399. Neither this eminent writer, nor Linnæus, was well acquainted with these common *Carices*, Mr. Curtis being the first who well explained them. The late Mr. Davall, from whom I have Swiss specimens of the *riparia*, thought Haller had it not, though he has referred to its synonyms, intermingled with those of other species. If the *fruit*, and the awns of the *scales*, be attended to, no mistake can be made.

55. *C. lævigata*. Smooth-stalked Beaked *Carex*.

Catkins cylindrical; fertile ones stalked. *Scales* all pointed. *Sheaths* very long. *Fruit* triangular, with a cloven *beak*.

C. lævigata. *Sm. Tr. of L. Soc.* v. 5. 272. *Fl. Br.* 1005. *Engl. Bot.* v. 20. t. 1387. *Hook. Scot.* 269. *Willd. Sp. Pl.* v. 4. 295. "Schk. *Car. t.* S, s, s. f. 162." *Willd.*

C. patula. *Schk. Car.* 115. t. B, b, b. f. 116.

C. æthiopica. *Schk. Car.* 107. t. Z. f. 83.

In marshes, and boggy thickets.

In a marsh near Glasgow. *Mr. J. Mackay*. Near Aberdeen. *Prof. J. Beattie, jun.* On Warley Common, Essex; also in Cornwall and Sussex. *Mr. E. Forster*.

Perennial. *June*.

Root tufted, with long stout fibres. *Herbage* of a bright light green, quite smooth in every part, except the upper *bractæas* being rough at the edges, the lower one at the tip only. *Stems* from 2 to 4 feet high, triangular; leafy in the lower part. *Leaves* erect, about one-third of an inch broad, pointed, striated, the uppermost only rough-edged towards the extremity; all with long, close, striated, smooth *sheaths*. *Bractæas* leafy, long and narrow, with very long *sheaths*. *Catkins* cylindrical, erect; barren ones usually 2, an inch long, or more, rather lanceolate, acute; their *scales* light brown, lanceolate, acute, for the most part tipped with a small point, or awn. Fertile *catkins* 2 or 3, on very long, capillary, smooth *stalks*, much exceeding the

sheaths, each *catkin* near an inch and half long, bluntish, dense, but not stout; the *scales* lanceolate, brown with a green keel, tapering into a rough point, various in length. *Stam.* 3. *Stigm.* 3. *Fruit* longer than the scales, ovate, triangular, green, ribbed, smooth, not tumid or inflated; tapering into a flattish, smooth, deeply cloven, *beak*. *Seed* filling the cavity of the fruit, stalked, triangular, short, brown.

56. *C. vesicaria*. Short-spiked Bladder *Carex*.

Fertile catkins cylindrical, short, abrupt, on short stalks. Scales all lanceolate, acute. Sheaths none. Fruit ovate, inflated, with an elongated cloven beak.

C. vesicaria. *Linn. Sp. Pl.* 1388, α and γ . *Willd. v.* 4. 307. *Fl. Br.* 1005. *Engl. Bot. v.* 11. t. 779. *Hook. Scot.* 269. *Don H. Br.* 193. *Dicks. H. Sicc. fasc.* 14. 18. *Fl. Dan. t.* 647. *Leers* 205 γ . t. 16. f. 2. III. *Schk. Car.* 124. t. S, s. f. 106. *Ehrh. Calam.* 60.

C. inflata. *Huds.* 412? *Lightf.* 567.

C. n. 1409. *Hall. Hist. v.* 2. 200.

Cyperoides vesicarium, spicis viridantibus, vel subfuscis. *Scheuchz. Agr.* 470.

Gramen cyperoides majus præcox, spicis turgidis teretibus flavescens. *Dill. in Raii Syn.* 420. *Moris. v.* 3. 242. sect. 8. t. 12. f. 6.

In marshes, and wet meadows.

In Wales and the north of England. *Huds.* In Breadalbane and other parts of Scotland. *Lightf.* About Oxford, but rarely. *Borrbart.* By the water-works at Pimlico, and in other swampy places about London.

Perennial. *May*.

Root creeping. *Stem* erect, 2 feet high, with 3 very sharp rough angles. *Leaves* light green, erect, rather narrow, taper-pointed, rough-edged. *Bractees* narrower, with long slender points, rising above the stem, without any sheaths, or occasionally with some very short ones. Barren *catkins* 2 or 3, often solitary, slender, acute, near $1\frac{1}{2}$ inch long; their *scales* linear-lanceolate, rusty, sharpish, but without any *awn*. Fertile 3 or 4, generally on short, smooth, triangular *stalks*, the lower stalks, as usual, variable; each *catkin* about an inch, occasionally 2, in length, obtuse, a little drooping, becoming turgid and thick in ripening, and finally pale, almost straw-coloured; *scales* lanceolate, acute, or pointed, brown, with a green keel. *Stam.* 3. *Stigm.* 3, with a *style* of nearly their own length. *Fruit* crowded, spreading, longer than the scales, ovate, inflated, ribbed, yellowish and shining when ripe, very smooth, terminating in a gradually tapering *beak*, whose extremity is deeply cloven into 2 sharp points.

Seed small, sessile, triangular, short, not near filling the cavity, crowned with the long permanent *style*.

The two varieties of Linnæus, quoted above, are merely different stages of the fructification; his β is *C. sylvatica*, totally unlike *vesicaria*.

57. *C. ampullacea*. Slender-beaked Bottle Carex.

Fertile catkins cylindrical, elongated, nearly sessile. Scales all lanceolate, acute. Sheaths none. Fruit inflated, globose, with a linear cloven beak.

C. ampullacea. Gooden. *Tr. of L. Soc.* v. 2. 207. Willd. *Sp. Pl.* v. 4. 308. Fl. Br. 1006. Engl. Bot. v. 11. t. 780. Hook. Scot. 270. Schk. *Car.* 125. t. T, t. f. 107.

C. vesicaria. Huds. 413. Lightf. 566. Leers 205 α . t. 16. f. 2. II.

C. rostrata. Sibth. 32. Abbot 206.

C. obtusangula. Ehrh. *Calam.* 50.

C. n. 1401. Hall. *Hist.* v. 2. 198.

Gramen cyperoides polystachyon majus, spicis teretibus erectis. Raii *Syn.* 419.

G. cyperoides medium angustifolium, spicis teretibus erectis flavescens. Moris. v. 3. 242. sect. 8. t. 12. f. 8.

G. cyperoides angustifolium, spicis longis erectis. Bauh. *Theatr.* 84. f.

In pools, marshes, and the margins of rivers, not very common. About Middleton, Warwickshire. Ray. In Oxfordshire. Dill. Sibth. Rare in Bedfordshire. Abbot. Near Bungay. Mr. Woodward. In Gloucestershire. Withering. At Virginia water. Bishop of Carlisle. Common in the north of England, and in Scotland. Curtis, Hooker.

Perennial. May.

Root creeping. *Stem* 1 or 2 feet high, with 3 blunt angles, smooth, except above the lowermost bractea. *Leaves* narrower than the foregoing, erect, somewhat glaucous, acute, rough at the edges and keel near the extremity. *Bracteas* very narrow, with no sheaths, except the lower one. Barren catkins 2 or 3, much like the last; fertile with similar short stalks, but otherwise very different, nearly twice as long, and scarcely above half so thick, upright; their scales lanceolate, acute. Stam. 3. Stigm. 3, with a longish style. *Fruit* copious and crowded, longer than the scales, half the size of *C. vesicaria*, moderately spreading, inflated; almost globular, ribbed, smooth, yellowish, abruptly tipped with a linear beak, cloven at the extremity. *Seed* small, sessile, elliptical with 3 angles, crowned with the style.

The fruit of this species resembles a bottle or flask, *ampulla*; that of the last a bladder, *vesica*; so that they ought never to have been confounded in character or name; to say nothing of the totally different shapes of their catkins when ripe.

58. *C. hirta*. Hairy Carex.

Herbage hairy. Fertile catkins ovate-cylindrical, remote. Scales awned. Sheaths nearly as long as the flower-stalks. Fruit hairy, tumid, with a deeply-cloven beak. Stem rough-edged.

C. hirta. Linn. *Sp. Pl.* 1389. Willd. *v.* 4. 311. *Fl. Br.* 1007. Engl. Bot. *v.* 10. *t.* 685. Hook. *Scot.* 270. Dicks. *H. Sicc. fusc.* 11. 16. Leers 206. *t.* 16. *f.* 3. Schk. *Car.* 127. *t.* U, u. *f.* 108. Ehrh. *Calam.* 100.

C. anonyma. *Fl. Dan.* *t.* 425.

C. n. 1403. Hall. *Hist.* *v.* 2. 198.

Cyperoides polystachyon lanuginosum. Scheuchz. *Agr.* 478.

Gramen cyperoides polystachyon lanuginosum. Raii *Syn.* 418. Moris. *v.* 3. 243. *sect.* 8. *t.* 12. *f.* 10. Pluk. *Almag.* 178. *Phyt.* *t.* 34. *f.* 6.

β. fertile catkins compound. Schk. *t.* U, u. *f.* B.

In wet meadows, woods, and watery places, frequent.

β. At Copgrove, Yorkshire. Mr. D. Turner.

Perennial. May, June.

Root creeping extensively, with long, stout, scaly runners, and densely shaggy radicles. Whole herb clothed, more or less copiously, with fine, soft, shaggy hairs, which the Bishop of Carlisle has observed occasionally to disappear almost entirely, in wet situations, except at the top of the sheaths of the leaves, never quite smooth, and usually thickly bearded. Stem erect, 2 feet high, leafy, with 3 sharp rough angles. Leaves scarcely so tall, upright, flat, rough-edged, pointed, most hairy beneath. Bractees like the leaves, their sheaths, which are often smooth, embracing nearly the whole of each flower-stalk. Barren catkins 2 or 3, lanceolate, erect, light brown, their filmy-edged scales pointed; lower ones awned; fertile 2 or 3, distant, stalked, erect, cylindrical, or somewhat ovate, about an inch long; their scales ovate, smooth, membranous, keeled, with long, slender, rough awns. Stam. 3. Stigm. 3. Fruit ovate, tawny, ribbed, always, I believe, hairy, tumid all round, though scarcely inflated; the beak broad, rough, deeply cloven, acute. Seed roundish, with 3 angles, tipped with part of the style.

The separate catkin in *Fl. Dan.* *t.* 379, which has been thought to belong to this species, may perhaps be *C. filiformis*, like the principal figure. Schkuhr having rightly determined the anonymous plate *t.* 425 of that work to be *C. hirta*, renders the other less important. Plukenet's *t.* 34. *f.* 6, must be intended for this, though the leaves answer better to *C. filiformis*.

A specimen of Schkuhr's variety, our β, gathered in Yorkshire by Mr. Turner, has not only the lower part of each fertile catkin

copiously branched, but the *barren* ones likewise are so multiplied, or divided at the base, that they amount to 6 or more.

59. *C. secalina*. Rye *Carex*.

Fertile catkins ovate-cylindrical; the lower one very remote. Scales acute. Sheaths as long as the flower-stalks. Fruit ovate, rough-edged, compressed; concave at the inner side; with an elongated, linear, cloven beak. Stem smooth.

C. secalina. Willd. *Sp. Pl.* v. 4. 309. Wahlenb. *Stockh. Trans.* for 1803. 151. Schk. *Car. B.* 139. t. S. f. 65.

β. Fertile catkins aggregate. Schk. t. K, k. f. 98. Willd. v. 4. 310. In valleys in Scotland.

In a Den near Panmure, about 9 miles south-east of Forfar. Mr. T. Drummond.

Perennial. June, July?

Root apparently creeping, with stout, dark-brown, reddish, branched fibres. *Herbage* naked. *Stems* a foot high or more, erect, with 3 very smooth angles; leafy below. *Leaves* linear, flat, ribbed, rough-edged, pointed, rather narrow, resembling those of the last, but not hairy. *Bractees* like the leaves, very long, with naked smooth *sheaths*, from 1 to 2 inches in length. *Barren catkins* 2, often solitary, slender, with obovate, blunt, filmy *scales*; fertile 3 or 4, the uppermost often near together; in β aggregate; the lower one, or two, very remote; all on *stalks* concealed by the *sheaths* of the *bractees*, erect, short, thick, with ovate acute *scales*, pale and thin at their edges. *Stam.* 3. *Stigm.* 3. *Fruit* large, ovate, with a thin rough edge; convex and strongly ribbed externally, without any hairiness; deeply concave at the inner side, being so greatly compressed as to have no considerable cavity, by which character it essentially differs from *C. hirta*, the *beak*, moreover, being longer, narrower, rough at the edges, and somewhat membranous at the orifice. *Seed* obovate-oblong, triangular.

My liberal friend Mr. W. Robertson of Newcastle favoured me with specimens of this, among Mr. Drummond's Scottish discoveries, under the name of *C. hordeiformis*, on the authority of a French botanist. It may be that species, of which we know nothing but from a figure of Villars, copied in Schkuhr, t. D, d, d, f. 121. I have most of the plants of Villars, an excellent and original author, though his figures are bad; but unluckily I cannot find a specimen of his *Carex* in question. I think there can be no doubt of its being the same as *C. secalina*, Schkuhr having actually seen the latter only.

60. *C. stictocarpa*. Dotted Carex.

Fertile catkins two, ovate, stalked. Scales pointed. Sheaths scarcely any. Fruit obovate, obtuse, pointless, finely dotted.

In the highlands of Scotland.

On the lofty mountains of Clova, Angusshire. *Mr. G. Don.*

Perennial. *June, July?*

Root creeping extensively, with brown scaly runners, much like *C. hirta*. Stem erect, about a foot high, triangular, smooth; leafy in its lower half. Leaves erect, linear-lanceolate, pointed, flat, the breadth of *C. hirta*, but quite naked and smooth, except a roughness at the edges and keel near the extremity; the under surface rather glaucous; the sheaths long, close and abrupt. Bractees leafy, as tall as the stem, very slightly, or not at all sheathing at their base, destitute of auricles. Barren catkins 2, rather distant, erect, linear, obtuse, the upper or largest, near an inch long; scales obovate, obtuse, pointless, dark-brown, with a pale rib. Fertile catkins 2, not more distant than the barren ones, ovate, not half an inch long, erect, each on a stout triangular stalk, about its own length; scales ovate, dark-brown, each with a very strong, green mid-rib, ending in a shortish, stout, rather blunt point, or awn. Stigm. 3, almost sessile. Fruit shorter than the scales, roundish-obovate, somewhat triangular, a little compressed, greenish, or tawny, smooth, all over finely besprinkled with minute, brown, or reddish, depressed dots; its termination very abrupt, without any beak. Seed not observed.

In general appearance this plant much resembles *C. nutans* of Host, *Willd. v. 4. 299*; but the fruit of that species is ovate, tapering into a broad, deeply cloven, beak, and the scales of the barren, as well as fertile, catkins, are more or less awned. The fruit of ours rather agrees with that of *C. rigida*, or *recurva*, and its habit perhaps with *pulla*, *globularis*, and their allies; but the 2 very distinct barren catkins, however exceptionable that character may occasionally prove, oblige us to refer *C. stictocarpa* to the present section, which its agreement, in some points, with *hirta* and *filiformis* may further justify. I have seen but a single specimen.

61. *C. angustifolia*. Narrow-leaved Carex.

Fertile catkins one or two, ovate, stalked. Scales obtuse. Sheaths none. Fruit ovate, compressed, smooth, with a short abrupt beak. Leaves linear, channelled.

In marshes in Scotland.

In a marsh in Angusshire. *Mr. G. Don.*

Perennial. *June?*

Of this I have seen but one specimen, and that none of the best.

The *herbage* is of a very slender habit, and smooth. *Stem* triangular, 15 inches high, leafy at the bottom only. *Leaves* not quite so tall, erect, linear, acute, extremely narrow, channelled, or involute, at least when dry. *Bractees* leafy, but flatter, reaching nearly to the summit of the stem, without *sheaths*, or *auricles*. *Barren catkins* 2, the uppermost stout, obovate, obtuse, $\frac{1}{2}$ an inch long; the other ovate, much smaller; their *scales* obovate-oblong, pointless, dark chestnut-coloured, with a pale rib. *Fertile catkin* at a little distance below, on a shortish *stalk*, erect, ovate, $\frac{1}{4}$ of an inch long, with similar *scales*. *Stam.* 3. *Stigm.* all fallen. *Fruit* greenish ovate, slightly ribbed, smooth, moderately compressed, with a very short, abrupt, scarcely notched, *beak*.

The *leaves* approach *C. nardifolia*, Willd. v. 4. 304; the *fruit* and *scales* *C. stricta*; but the *stigmas* are unfortunately wanting. I cannot refer this *Carex* to any described species, though in many particulars it is not very remote from the following. Their *fruits* however are altogether dissimilar.

62. *C. filiformis*. Slender-leaved *Carex*.

Fertile catkins ovate. Scales pointed. Sheaths nearly equal to the short flower-stalks. Fruit ovate, hairy, with a deeply cloven beak. Leaves linear, channelled, smooth.

C. filiformis. Linn. Sp. Pl. 1385. Willd. v. 4. 303. Gooden. Tr. of L. Soc. v. 2. 172. t. 20. f. 5. Fl. Br. 1008. Engl. Bot. v. 13. t. 904. Hook. Scot. 270. Don. H. Br. 43. Fl. Dan. t. 1344. Wahlenb. Lapp. 234. Schk. Car. 82. t. K. f. 45.

C. angustifolia. Linn. Ms. in Sp. Pl. ed. 1. 975.

C. tomentosa. Lightf. 553. Huds. 650.

C. hirta. Fl. Dan. t. 379.

C. lasiocarpa. Ehrh. Calam. 19.

C. splendida. Willd. Berol. 33. t. 1. f. 3.

In boggy meadows, not common.

Plentifully at the south end of Ayr Links, Scotland. Dr. Hope. In the Moss of Restenet, and other places in Scotland. Mr. J. Mackay. In a bog near Aviemore, Strathspey. Mr. Borrer. Near Eaton, Shropshire. Rev. E. Williams. Near Stoke, Norfolk. Rev. R. Forby.

Perennial. *June*.

Root creeping. *Herbage* smooth. *Stem* erect, leafless, except at the very bottom, 2 feet high, straight, slender, round, rushy; often triangular, with rough edges, at the summit. *Leaves* upright, straight, narrow, channelled, or involute, pointed rough at the edges only, rounded at the back, without any *keel*. *Bractees* very similar to the foliage, partly rising above the stem, with

short *sheaths*, and small *auricles*. Barren *catkins* 2, very rarely solitary, a little distant, lanceolate; the largest an inch and half long, with pointed, dark-brown *scales*, having a yellow mid-rib. Fertile ones 2, very seldom solitary, more or less remote, ovate, erect, on *stalks* hardly extending beyond their sheaths; their *scales* like the others, but more decidedly pointed, or awned. *Stam.* 3. *Stigm.* 3, on a short *style*. *Fruit* ovate, ribbed, turgid, ending in a broad, deeply cloven *beak*, and entirely covered with short, dense, tawny, shining hairs. *Seed* elliptical, triangular, tipped with the base of the style.

I have been inclined to suppose that Plukenet's *t.* 34. *f.* 6 was taken from this species, which its *leaves* resemble much more than *C. hirta*; but it is more probable his drawing was incorrect. The separate *catkin*, in *Fl. Dan.* t. 379, may as well belong to the plant there delineated, which is certainly *C. filiformis*, as to *hirta*, not agreeing well with either.

428. KOBRESIA. Kobresia.

Willd. Sp. Pl. v. 4. 205. *Sm. in Rees's Cycl.* v. 20. *Comp. ed.* 4. 146.

Nat. Ord. see n. 427.

Barr. fl. *Cal.* the inner *scales* of a *catkin*, each oblong, slightly concave, single-flowered, permanent; sometimes wanting. *Cor.* none. *Filam.* 3, capillary, erect, longer than the calyx. *Anth.* vertical, linear, erect, of 2 cells.

Fert. fl. *Cal.* the outer *scales* of the same *catkin*, rather larger, involute, sheathing, elliptic-oblong, single-flowered, permanent. *Cor.* none. *Germ.* superior, triangular. *Style* 1, short, cylindrical. *Stigm.* 3, tapering, spreading, downy. *Seed* 1, naked, except the permanent *scale* which shelters it, triangular, pointed, hard.

Habit like *Carex*.

1. *K. caricina*. Compound-headed Kobresia.

Catkins aggregate, crowded, alternate.

K. caricina. *Willd. Sp. Pl.* v. 4, 206. *Comp. ed.* 4. 155.

Carex hybrida. *Schk. Car. t.* R, r, r. *f.* 161. According to Willdenow.

Schœnus monoicus. *Engl. Bot.* v. 20. t. 1410.

On mountains, in moist muddy spots.

In the county of Durham. *Mr. Dickson.* On Cronkley Fell, and about Widdy Bank in Tcesdale forest. *Rev. J. Harriman.*

Perennial. *August.*

Roots fibrous, densely tufted, crowned with the brown, sheathing bases of old leaves. *Stems* solitary, erect, simple, naked, round,

striated, from 3 to 5 inches high; angular, and rough-edged, at the top. *Leaves* several, radical, spreading or recurved, linear, channelled, acute, rough-edged, shorter than the stem; their longish *sheaths* closely embracing its base, each crowned with a short membranous *stipula*. *Catkins* 4 or 5, alternate, brown, crowded into an ovate, upright *spike*, not an inch long, having a short, sheathing, brown, membranous *bractea*, or two, at its base.

MONOECIA TETRANDRIA.

429. LITTORELLA. Shore-weed.

Linn. Mant. 160. *Juss.* 90. *Fl. Br.* 1011. *Lam. t.* 758.

Nat. Ord. Plantagines. *Juss.* 31. See *Plantago*, v. 1. 213.

Barr. fl. Cal. of 4 ovate, upright, acute leaves. *Cor.* of 1 petal, tubular, permanent; tube the length of the calyx, rather tumid; limb in 4 deep, equal, ovate, acute, moderately spreading segments, finally membranous. *Filam.* "from the bottom of the tube," (*Hooker*), capillary, very long, at first doubled inward, then erect, equal, finally flaccid. *Anth.* erect, heart-shaped, of 2 cells, bursting lengthwise.

Fert. fl. Cal. none. *Cor.* of 1 petal, membranous, permanent, in 3 or 4 deep, unequal, acute segments. *Germ.* superior, elliptic-oblong, very small. *Style* thread-shaped, erect, very long. *Stigm.* simple, acute. *Nut* oval, of one cell, not bursting. *Seed* solitary.

Herbaceous, with the habit of some species of *Plantago*. Only one species known.

1. *L. lacustris*. Plantain Shore-weed.

L. lacustris. *Linn. Mant.* 295. *Willd. Sp. Pl. v.* 4. 330. *Fl. Br.* 1011. *Engl. Bot. v.* 7. t. 468. *Hook. Scot.* 271. *Lond. t.* 168. *Dicks. H. Sicc. fasc.* 14. 14.

Plantago uniflora. *Linn. Sp. Pl.* 167. *Fl. Dan. t.* 170.

P. n. 655. *Hall. Hist. v.* 1. 292.

P. palustris, *gramineofolio*, *monanthos*, *parisiensis*. *Raii Syn.* 316.

Gramen junceum, sive *Holosteum minimum palustre*, *capitulis longissimis filamentis donatis.* *Moris. v.* 3. 230. *sect.* 8. t. 9. f. 30.

Pluk. Almag. 180. *Phyt. t.* 35. f. 2.

Subularia repens, folio minùs rigido. *Dill. in Linn. Corresp.* v. 2. 136.

S. repens, foliis convexo-planis. *Dill. Musc.* 542. t. 81.

In watery sandy places, especially about the margins of lakes and pools.

Perennial. *June.*

Root somewhat fleshy, tap-shaped, with numerous simple fibres, as well as some horizontal runners, from the crown. *Stem* none.

Leaves several, ascending, 3 or 4 inches long, linear, entire, fleshy, slightly channelled; commonly smooth, but the Rev. Mr. Williams has found a hairy variety in Shropshire. *Barren fl.* generally solitary, on simple upright *stalks*, greenish; fertile ones radical, sessile, their *styles* chiefly visible. Mr. Wilson of Warrington has communicated specimens of a variety with 2 barren *flowers* on each *stalk*, found in Anglesea, in only one place, but there plentifully.

430. ALNUS. Alder.

Tourn. t. 359. *Willd. Sp. Pl.* v. 4. 334. *Hall. Hist.* v. 2. 300. *Comp. ed.* 4. 146. *Gærtn. t.* 90.

Nat. Ord. *Amentaceæ*. Linn. 50. Juss. 99.

Barr. fl. numerous, aggregate, in a loose, cylindrical *catkin*, imbricated every way. *Cal.* a permanent, wedge-shaped *scale*, 3-flowered, with 2 very minute lateral scales. *Cor.* composed of 3 equal *florets*, attached to the inner side of every scale, each of 1 *petal*, in 4 deep, equal, ovate, obtuse segments. *Filam.* 4, from the tube of the corolla, shorter than its segments, and opposite to them. *Anth.* of 2 round lobes.

Fert. fl. fewer, aggregate, in an oval, firm *catkin*, imbricated every way. *Cal.* a permanent, wedge-shaped *scale*, 2-flowered. *Cor.* none. *Germen* compressed, of 2 cells. *Styles* 2, parallel, tapering, a little prominent, deciduous. *Stigm.* simple. *Nut* ovate, bony, compressed, angular, without wings, of 2 cells. *Kernels* solitary, ovate, acute. *Trees*, with hard wood. *Leaves* alternate, stalked, simple, wavy or cut, deciduous, with twin deciduous *stipulas*. *Catkins* terminal, paniced, pendulous, earlier than the foliage.

1. *A. glutinosa*. Common Alder.

Leaves roundish-wedge-shaped, wavy, serrated, glutinous, rather abrupt; downy at the branching of the veins beneath.

A. glutinosa. *Gærtn. v. 2. 54. Willd. Sp. Pl. v. 4. 334. Comp. ed. 4. 155. Hook. Lond. t. 59. Scot. 271.*

A. n. 1370. Hall. Hist. v. 2. 300.

Alnus. Raii Syn. 442. Ger. Em. 1477. f. Lob. Ic. v. 2. 191. f. Trag. Hist. 1084. f. Matth. Valgr. v. 1. 127. f. Camer. Epit. 68. f. Loes. Pruss. 10. t. 1. Dalech. Hist. 97. f.

Betula Alnus. Linn. Sp. Pl. 1394, α. Fl. Br. 1013. Engl. Bot. v. 21. t. 1508.

B. emarginata. Ehrh. Arb. 9.

Common Alder. *Hunt. Evel. Sylv. 240. f.*

In watery meadows, near lakes, rivers, or pools.

Tree. *March.*

Trunk crooked, rugged, of no great height; with crooked, spreading, round, smooth *branches*, glutinous when young. *Leaves* roundish, obtuse, or lopped at the end, wavy, serrated, plaited, glutinous, of a deep shining green, with one rib, and many transverse parallel veins, downy at their origin beneath. *Stipulas* roundish, entire. *Barren catkins* long, pendulous; fertile short, oval, more spreading, permanent.

Wood reddish, hard, though brittle, used chiefly for women's clogs or pattens. The *bark* dyes linen of a dull red, and with iron brown, or black. Alders have the colour and effect of oaks, in wet boggy situations, where the latter will not thrive.

431. BUXUS. Box-tree.

Linn. Gen. 486. Juss. 388. Fl. Br. 1013. Tourn. t. 345. Lam. t. 761. Gærtn. t. 108. Juss. fl. Euphorb. 13. t. 1. f. 3.

Nat. Ord. *Tricoccæ.* Linn. 38. *Euphorbiæ.* Juss. 96.

Barr. fl. Cal. of 3 roundish, obtuse, concave, spreading, coloured leaves. *Pct.* 2, roundish, concave, spreading, similar to the calyx, but rather larger. *Filam.* 4, awl-shaped, spreading, about the length of the petals. *Anth.* 2-lobed, incumbent. A slight rudiment of a *germen*.

Fert. fl. from the same bud. *Cal.* inferior, of 4 roundish, obtuse, concave, spreading, permanent, leaves. *Pct.* 3, roundish, concave, like the calyx, but larger. *Germ.* superior, nearly globular, with 3 blunt angles, or lobes. *Styles* 3, spreading, short, thick, permanent. *Stigm.* obtuse, rough. *Caps.* globular, with 3 spreading beaks, of 3 cells, and 3 valves, bursting elastically. *Seeds* 2 in each cell, erect, parallel, oblong, slightly compressed; externally rounded.

Evergreen *shrubs*, or small *trees*, with rigid, smooth, stalked, opposite, entire *leaves*. *Fl.* aggregate, from axillary buds, whitish. *Fr.* green.

1. *B. sempervirens*. Common Box-tree.

Leaves ovate, convex. Footstalks slightly downy at the edges. Anthers ovate-arrow-shaped.

B. sempervirens. *Linn. Sp. Pl.* 1394. *Willd. v. 4.* 337. *Baumz.* 49. *Fl. Br.* 1013. *Engl. Bot. v. 19. t.* 1341. *Bull. Fr. t.* 263.

B. sempervirens arborescens. *Ehrh. Arb.* 138. *Pl. Off.* 219.

B. n. 1610. *Hall. Hist. v. 2.* 283.

Buxus. *Raii Syn.* 445. *Ger. Em.* 1410. *f. Lob. Ic. v. 2.* 128. *f. Dod. Pempt.* 782. *f. Trag. Hist.* 1069. *f. Matth. Valgr. v. 1.* 172. *f. Camer. Epit.* 101. *f. Dalech. Hist.* 165. *f.*

β. *B. angustifolia*. *Dill. in Raii Syn.* 445.

On dry chalky hills, in several parts of England.

Upon Box-hill, near Dorking, Surrey; at Boxwell, Gloucestershire; and at Boxley in Kent; there are woods of this tree; Mr. Aubry. *Ray*. Plentiful on the chalk hills near Dunstable. Mr. Woodward.

β. On Box-hill. Mr. Doodly.

Tree, or shrub. *April*.

A small tree, of very slow growth. Leaves ovate, hardly an inch long, dark shining green, turning to a vivid tint of vermilion in autumn; concave and paler beneath. Stipulas none. Footstalks, as well as the young branches, more or less downy. Fl. pale yellow, or cream-coloured, tufted, variable in the number of their petals.

Box wood is yellowish, hard, heavy, of a firm close texture, not liable to split. Hence its value for making mathematical instruments; and, above all, for engraving in wood; an art so exquisitely improved of late in this country, as to have almost the merit of a new invention.

432. URTICA. Nettle.

Linn. Gen. 486. *Juss.* 403. *Fl. Br.* 1014. *Tourn. t.* 308. *Lam. t.* 761. *Gærtn. t.* 119.

Nat. Ord. *Scabridæ*. *Linn.* 53. *Urticæ*. *Juss.* 98.

Barr. fl. Cal. of 4 roundish, concave, obtuse, equal leaves. *Pet.* none. *Nect.* central, cup-shaped, entire, contracted below, variable in size. *Filam.* 4, awl-shaped, spreading, opposite to the calyx-leaves, and about as long. *Anth.* of 2 round lobes.

Fert. fl. Cal. inferior, of 2 equal, roundish, concave valves. *Cor.* none. *Germ.* superior, ovate. *Style* none. *Stigma* downy. *Seed* 1, naked, ovate, rather compressed, polished, embraced by the permanent calyx.

A numerous, herbaceous, or shrubby, genus, with opposite

or alternate, simple *leaves*, mostly serrated. *Fl.* in clusters, panicles, spikes, or heads, sometimes on separate plants, green. *Herbage* in all our species copiously armed with venomous perforated bristles, each of which has a bag of liquid poison at its base. This liquor, by a slight pressure of the hand, is transmitted into the skin, causing great irritation. Most of the numerous exotic species have not this stinging property.

1. *U. pilulifera*. Roman Nettle.

Leaves opposite, ovate, serrated; with transverse ribs. Fertile flowers in globular heads.

U. pilulifera. *Linn. Sp. Pl.* 1395. *Willd. v. 4.* 347. *Fl. Br.* 1014. *Engl. Bot. v. 3. t.* 148. *Mill. Illustr. t.* 79.

U. pilulifera, folio profundius, *Urticæ majoris* in modum, serrato, semine magno lini. *Raii Syn.* 140.

U. romana. *Ger. Em.* 706. *f. Lob. Ic.* 522. *f. Trag. Hist.* 3. *f. Fuchs. Hist.* 106. *f. Bauh. Hist. v. 3. p.* 2. 445. *f.*

U. vera. *Fuchs. Ic.* 58. *f.*

U. prima. *Matth. Valgr. v. 2.* 469. *f. Camer. Epit.* 861. *f. Dalech. Hist.* 1245. *f.*

Roman Nettle. *Petiv. H. Brit. t. 1. f.* 11.

In waste ground, amongst rubbish, chiefly near the sea.

At Yarmouth, Norfolk, and Aldborough, Suffolk. *Ray*. About Lowestoft and Bungay, Suffolk.

Annual. *June, July*.

Herb armed all over with peculiarly venomous stings. *Stem* branched, leafy, bluntly quadrangular, often purple, about 2 feet high. *Leaves* of a dull greyish green, ovate, sometimes heart-shaped, coarsely serrated, with many transverse ribs. *Stipulas* ovate. *Fl.* axillary, on twin *stalks*; that of the barren ones loosely paniced; of the fertile simple, much the shortest, bearing a dense, globular, stinging *head* of tumid *flowers*. *Seed* brown, polished.

U. balearica of Linnæus appears a mere variety, with more heart-shaped *leaves*; for this is evidently a variable character, in that as well as in our *romana*.

2. *U. urens*. Small Nettle.

Leaves opposite, elliptical, with about five longitudinal ribs. Clusters nearly simple.

U. urens. *Linu. Sp. Pl.* 1396. *Willd. v. 4.* 352. *Fl. Br.* 1015. *Engl. Bot. v. 18. t.* 1236. *Curt. Lond. fasc. 6. t.* 70. *Hook. Scot.* 271. *Fl. Dan. t.* 739. *Bull. Fr. t.* 230.

U. n. 1615. *Hall. Hist.* v. 2. 287.

U. minor. *Raii Syn.* 140. *Ger. Em.* 707. *f.* *Brunf. Herb.* v. 1. 154. *f.* *Fuchs. Hist.* 108. *f.* *Ic.* 60. *f.*

U. minor acrior. *Lob. Ic.* 522. *f.*

U. tertia. *Matth. Valgr.* v. 2. 471. *f.* *Camer. Epit.* 863. *f.* bad. *Dalech. Hist.* 1244. *f.*

Small Nettle. *Petiv. H. Brit. t.* 1. *f.* 10.

In all cultivated ground, a troublesome weed, especially on a light soil.

Annual. *June—October.*

Smaller than the last, and of a much brighter green; its copious *stings* hardly less virulent. The several parallel ribs of the *leaves* form its distinguishing character. *Stipulas* linear, reflexed. *Clusters* oblong, scarcely branched, each bearing many barren, as well as fertile, *flowers*. *Cal.* of the latter ovate, a little compressed.

3. *U. dioica.* Great Nettle.

Leaves opposite, heart-shaped. Clusters much branched, in pairs, mostly dioecious. Roots creeping.

U. dioica. *Linn. Sp. Pl.* 1396. *Willd. v.* 4. 352. *Fl. Br.* 1016. *Engl. Bot. v.* 25. *t.* 1750. *Curt. Lond. fasc.* 6. *t.* 69. *Hook. Scot.* 271. *Fl. Dan. t.* 746.

U. n. 1614. *Hall. Hist.* v. 2. 286.

U. racemifera major perennis. *Raii Syn.* 139.

U. urens. *Ger. Em.* 706. *f.*

U. sylvestris asperior. *Lob. Ic.* 521. *f.*

U. major. *Brunf. Herb.* v. 1. 151. *f.* *Fuchs. Hist.* 107. *f.* *Ic.* 59. *f.*

U. secunda. *Matth. Valgr.* v. 2. 470. *f.* *Camer. Epit.* 862. *f.* *Dalech. Hist.* 1245. *f.*

Great Nettle. *Petiv. H. Brit. t.* 1. *f.* 9.

In waste ground, whether open or shady, and under hedges, very common.

Perennial. *July, August.*

Root branching and creeping, with fleshy shoots, and many fibrous radicles. *Herb* of a duller green than the last, erect, 3 feet high, with less irritating *stings*. *Leaves* large, spreading, pointed, strongly serrated, veiny. *Clusters* numerous, much branched, many-flowered. *Fl.* on one root chiefly barren; on another mostly fertile. *Cal.* of the latter occasionally with 2, or more, supernumerary leaves.

The fibres of the *stem* may be manufactured like hemp, and are often found in winter naturally separated and bleached.

MONOECIA PENTANDRIA.

433. XANTHIUM. Bur-weed.

Linn. Gen. Pl. 487. *Juss.* 191. *Fl. Br.* 1017. *Tourn. t.* 252. *Lam. t.* 765. *Gærtn. t.* 164.

Nat. Ord. *Compositæ*, ζ, *nucamentaceæ*. *Linn.* 49. *Corymbiferæ*, sect. 9, *anomalæ*. *Juss.* 55.

Barr. fl. compound. *Common Cal.* of many, thin, imbricated, equal scales, on a level with the numerous *florets*. *Cor.* compound, hemispherical, uniform; *florets* monopetalous, tubular, funnel-shaped, erect, in 5 equal, marginal segments. *Filam.* 5 in each floret, converging in the form of a cylinder. *Anth.* erect, distinct, parallel. *Common Recept.* scarcely any; the *florets* are separated by scales.

Fert. fl. below the barren ones. *Common Cal.* 2-flowered, of 2 opposite, acutely and unequally 3-lobed, leaves, beset all about with hooked prickles, and closely united to the germen in every part, except the segments. *Cor.* none. *Germ.* oval, clothed with the prickly calyx. *Styles* 2 pair, capillary. *Stigmas* undivided. *Drupa* spurious, formed of the permanent calyx, dry, elliptic-oblong, covered with prominent hooked prickles; cloven at the summit. *Nut* of 2 cells. *Seeds* solitary.

Herbaceous, or somewhat shrubby, rather downy, of a coarse habit. *Leaves* alternate, stalked, simple, lobed. *Stipulas* in some spinous. *Fl.* axillary and terminal, spiked, greenish, inconspicuous. *Fr.* large, aggregate, armed with hooked adhesive prickles.

1. *X. strumarium*. Broad-leaved Bur-weed.

Prickles none. Leaves heart-shaped; three-ribbed at the base.

X. strumarium. *Linn. Sp. Pl.* 1400. *Willd. v.* 4. 373. *Fl. Br.* 1017. *Engl. Bot. v.* 36. t. 2544. *Fl. Dan. t.* 970. *Ehrh. Pl. Off.* 419.

X. n. 1621. *Hall. Hist. v.* 2. 292.

X. seu Lappa minor. *Raii Syn.* 140. *Bauh. Hist. v.* 3. p. 2. 572. f. *Matth. Valgr. v.* 2. 545. f.

Xanthium. *Fuchs. Hist.* 579. f. *Ic.* 333. f.

Bardana minor. *Ger. Em.* 809. f. *Merr. Pin.* 14.

Small Burdock. *Petiv. H. Brit. t.* 1. f. 12.

In rich moist ground, or about dunghills, in the south of England, but rare.

Three miles from Portsmouth, towards London. *Ray*. About Dulwich. *Willisel, and Newton*. In a bog beyond Peckham. *Merrett*.

Annual. *August, September*.

Root fibrous. *Stem* solitary, erect, branched, leafy, 2 feet high, furrowed, solid, downy. *Leaves* on long stalks, lobed, cut, and doubly serrated, 2 or 3 inches wide, minutely downy all over; paler beneath. *Clusters* axillary, leafy, of 4 or 5 fertile *flowers*, and 1 or 2 barren ones; all green, making no show. *Nuts* densely armed, half an inch long, adhering to the rough coats of animals, like the *Arctium*, v. 3. 380.

Old tradition reports that the *Xanthium* is good for scrofulous disorders, as the specific name seems to indicate; but it is out of use. The generic appellation alludes to a quality of dyeing yellow, which Dioscorides mentions.

434. AMARANTHUS. *Amaranth*.

Linn. Gen. 490. *Juss.* 88. *Fl. Br.* 1018. *Tourn. t.* 118. H—L. *Lam. t.* 767. *Gærtn. t.* 128.

Nat. Ord. *Holeraceæ*. *Linn.* 12. *Amaranthi*. *Juss.* 30.

Barr. fl. Cal. of 3, or 5, erect, elliptic-lanceolate, coloured, permanent leaves. *Cor.* none. *Filam.* 3 or 5, capillary, erect, not longer than the calyx, opposite to its segments. *Anth.* oblong, versatile, of 2 lobes.

Fert. fl. in the same cluster. *Cal.* the same. *Cor.* none. *Germ.* superior, ovate. *Styles* 3, sometimes but 2. *Stigm.* undivided, acute, downy on the upper side. *Caps.* ovate, thin, bursting all round, of 1 cell. *Seeds* solitary, globose, compressed, filling the capsule.

Species numerous, chiefly extraeuropæan, herbaceous, annual, with stalked, alternate, simple, undivided, entire *leaves*, and copious, crowded, green or reddish *flowers*.

1. *A. Blitum*. Wild *Amaranth*.

Flowers three-cleft and triandrous, in small lateral tufts. Leaves ovate. Stem diffuse.

A. Blitum. *Linn. Sp. Pl.* 1405. *Willd.* v. 4. 387. *Fl. Br.* 1018. *Engl. Bot.* v. 31. t. 2212.

A. n. 1606. *Hall. Hist.* v. 2. 280.

Blitum rubrum minus. *Raii Cant.* 23. *Dill. in Raii Syn.* 157. *Bauh. Hist.* v. 2. 967. f. *Ger. Em.* 321. f.

B. rubrum. *Matth. Valgr.* v. 1. 411. f.

B. album. *Camer. Epit.* 236 ? f.

138 MONOECIA—PENTANDRIA. Bryonia.

Small Garden Blite. *Petiv. H. Brit. t. 7. f. 9.*

In low boggy rich ground, or on dunghills, not common.

In various places about Cambridge. *Ray.* In Battersea fields. *Mr.*

Dickson. At Ripton, Huntingdonshire. *Mr. Woodward.*

Annual. *August.*

Root tapering. *Stems* several, spreading or procumbent, branched, leafy, round, furrowed, smooth. *Leaves* ovate, more or less blunt, roughish at the edges only. *Fl.* green, crowded, tufted, in small, axillary, leafy clusters. *Seed* black and shining.

435. BRYONIA. Bryony.

Linn. Gen. 508. *Juss.* 394. *Fl. Br.* 1018. *Tourn. t.* 28. *Lam. t.* 796. *Gertn. t.* 88.

Nat. Ord. Cucurbitaceæ. *Linn.* 34. *Juss.* 97.

Barr. fl. *Cal.* of 1 leaf, bell-shaped, with 5 acute teeth.

Cor. connected with the calyx, bell-shaped, in 5 deep, ovate, spreading segments. *Filam.* 3, short. *Anth.* 5; 2 together, combined, on 2 of the filaments; the fifth solitary on the third filament.

Fert. fl. on the same, or a separate, plant. *Cal.* as in the barren fl., superior, deciduous. *Cor.* as in the barr. fl.

Germ. inferior. *Style* 3-cleft, shorter than the corolla. *Stigmas* cloven, spreading. *Berry* more or less globular, smooth and even, of 2 or more cells. *Seeds* in pairs, roundish, or somewhat angular, attached to the rind.

Perennial, or annual, herbaceous climbers, with simple spiral tendrils, and stalked, alternate, lobed, rough leaves.

Fl. variegated with green and white, or yellow, in axillary loose clusters, or panicles. *Berries* red or black.

1. *B. dioica.* Red-berried Bryony.

Leaves palmate, rough on both sides with callous points.

Barren and fertile flowers on separate plants.

B. dioica. *Jacq. Austr. t.* 199. *Willd. Sp. Pl. v. 4. t.* 621. *Fl. Br.* 1019. *Engl. Bot. v. 7. t.* 439. *Hook. Scot.* 272.

B. alba. *Huds.* 437. *Lightf.* 590. *Raii Syn.* 261. *Woodv. t.* 189. *Ger. Em.* 869. *f. Bull. Fr. t.* 55.

B. aspera, sive alba, baccis rubris. *Bauh. Pin.* 297. *Mill. Ic.* 47. *t.* 71.

Bryonia. *Trag. Hist.* 820. *f.*

Vitis alba, sive Bryonia. *Matth. Valgr. v. 2.* 620. *f. Camer. Epit.* 987. *f. Fuchs. Hist.* 94. *f. Ic.* 52. *f.*

In hedges and thickets very common.

Perennial. *May—September.*

Root large, fleshy, white, subdivided below, of a very acrid purgative quality. *Stems* herbaceous, annual, rough, leafy, more or less branched, climbing by their *tendrils* to the height of several feet. *Leaves* 3 or 4 inches broad, with 5 angular lobes, rough all over with minute callous tubercles; if slightly rubbed, in autumn, they exhale a musky scent. *Fl.* white, with elegant green ribs and veins, on panicked, or imperfectly umbellate, axillary stalks; all barren on one plant; fertile on another; at least for the first 2 or 3 years; but Miller observed that older roots produced both sorts of blossoms, on the same plant, as is proper to all the other known species of this genus. *Berries* scarlet, fetid when bruised. Sometimes every *filament* bears a double *anther*.

The true *B. alba* of Linnæus, found on the continent, has black fruit, being called *alba* from its white *root*, in contradistinction to *Tamus*, the Black-rooted Bryony.



MONOECIA HEXANDRIA.

436. ERIOCAULON. Pipewort.

Linn. Gen. 40. *Juss.* 44. *Fl. Br.* 1009. *Br. Pr.* 253. *Lam. t.* 50. *Gartn. t.* 83.

Nat. Ord. *Ensateæ*? *Linn.* 6. *Junci*, *sect.* 1. *Juss.* 13. *Res-tiaceæ*. *Brown Prodr.* 243.

Common Cal. hemispherical, many-flowered, imbricated; scales obovate, obtuse, equal, permanent.

Barr. fl. in the middle. *Cal.* none. *Cor.* of 1 petal; tube cylindrical; limb in 6 or 4 deep segments, in a double row. *Filam.* 6 or 4, occasionally 3, from the segments of the limb, and a little longer, thread-shaped, erect. *Anth.* roundish, of 2 oblong cells.

Fert. fl. in the circumference. *Cal.* none. *Pet.* 6 or 4, in a double row, obovate. *Germ.* 2- or 3-lobed, superior. *Style* 1, very short. *Stigm.* 2 or 3, awl-shaped, acute. *Caps.* with 2 or 3 rounded lobes, and as many cells and valves, bursting at the angles. *Seeds* solitary, globular, albuminous, with an external *embryo*.

Aquatic herbs, chiefly extraeuropæan, first properly understood by Mr. Brown, to whose *Prodromus*, and Dr. Hooker's dissections, we are indebted for the above improved characters of this genus. I have removed it to *Monoccia Hexandria*, the number 6 appearing to be the most complete in its *corolla* and *stamens*, though these parts, in some species, lay aside one third, according to the analogy of other monocotyledonous plants, and the flowers then become tetrandrous, as in our only species. No genus can be more natural, but the very numerous species are so much alike, and require such minute examination, that a competent character of any of them is very difficult.

1. *E. septangulare*. Jointed Pipewort.

Florets four-cleft. Capsule of two cells. Stem with about seven angles, many times taller than the channelled, taper-pointed leaves. Flower convex. Outer calyx-scales empty, rounded, smooth.

E. septangulare. *With.* 184. *Fl. Br.* 1010. *Engl. Bot.* v. 11. t. 733. *Hook. Scot.* 270. *Lond.* t. 52; excellent.

E. decangulare. *Lightf.* 569. *Hope in Phil. Trans.* v. 59. 243. t. 12. *Penn. Voy. to the Hebrides*, v. 1. t. 39.

Nasmythia articulata. *Huds.* 415.

In lakes, in the isle of Skye, and on the west coast of Ireland.

First observed in the isle of Skye by Mr. Robertson, in 1768, according to Dr. Hope; but by the Rev. Dr. Walker's herbarium, in Mr. Maughan's possession, it appears to have been discovered there, Sept. 11, 1764, by Sir John Macpherson, along with Dr. Walker, in a small lake by the road from Sconsar to Giesto. See *Hook. Scot.* In all the lakes and ditches about Cunnamara, Ireland. *Mr. J. T. Mackay.*

Perennial. *September.*

Roots creeping, with numerous, long, white, finely jointed *radicals*, matted together in dense tufts, so as to form floating islands. *Leaves* radical, numerous, channelled, smooth, 2 or 3 inches long, tapering gradually from a broadish base, to a capillary point, all finely cellular internally. *Stalk* 3 or 4 times as tall, with a tubular sheath at the base, solitary, simple, naked, a little twisted, having about 7 angles, occasionally more or less, with flat interstices. *Fl.* solitary, terminal, almost globular, like a white double daisy, though not half so large, finely downy, tinged with purple. *Anthers* prominent, dark violet.

MONOECIA POLYANDRIA.

437. CERATOPHYLLUM. Hornwort.

Linn. Gen. 493. *Juss.* 18. *Fl. Br.* 1020. *Lam. t.* 775. *Gærtn. t.* 44.
Dichotophyllon. Dill. Gen. 91. *t.* 3.

Nat. Ord. Inundatae. Linn. 15. *Naiades. Juss.* 6. Rather
 akin to *Hippuris*; see *v.* 1. 4; and therefore to Mr.
 Brown's *Halorageæ*, see *Grammar*, 167.

Barr. fl. Cal. in many, deep, equal, oblong, permanent, up-
 right segments. *Cor.* none. *Filam.* twice as many as
 the segments of the calyx, 16—20, erect, very short.
Anth. oblong, erect, rising above the calyx.

Fert. fl. Cal. as in the barren fl. *Cor.* none. *Germ.* superior,
 ovate, compressed. *Style* scarcely any. *Stigma* simple,
 oblong, oblique. *Drupa* ovate, compressed, crowned
 with the permanent stigma; its coat thin. *Nut* large, so-
 litary, the shape of the drupa; with 2 obovate *cotyledons*;
 and a many-cleft central *embryo*.

Branched floating *herbs*, with whorled forked *leaves*, and
 axillary, sessile *flowers*.

This genus is supposed by some botanists to be monocoty-
 ledonous, though Jussieu suspected otherwise, and Gærtn-
 er has plainly shown it to have 2 very distinct *cotyle-*
dons, which he chose to call a *vitellus*, taking the many-
 cleft *embryo*, or *plumula*, for *cotyledons*. The appearance
 of this latter part seems to have led M. Richard to think
 the genus allied to the *Coniferae*; but if it had really
 many-cleft *cotyledons*, like *Pinus*, that circumstance
 would only prove such a character worthless, as to real
 natural affinity. See Lindley in *Hook. Scot. p.* 2. 297.

1. *C. demersum.* Common Hornwort.

Fruit armed with three spines. Segments of the calyx
 notched at the extremity.

C. demersum. Linn. Sp. Pl. 1409. *Willd. v.* 4. 405. *Fl. Br.* 1020.
Engl. Bot. v. 14. *t.* 947. *Hook. Scot.* 272. *Gærtn. v.* 1. 212.
t. 44; *last f.*

C. n. 1599. *Hall. Hist. v.* 2. 275.

Dichotophyllon. Dill. Giss. 149.

Hydroceratophyllon folio aspero, quatuor cornibus armato. Vaill.
Mem. de l'Ac. des Sc. 299. *t.* 15. *f.* 1. *Raii Syn.* 135.

142 MONOECIA—POLYANDRIA. *Myriophyllum*.

Equisetum sub aquâ repens, foliis bifurcis. *Loes. Pruss.* 67. t. 12.

In ditches and fish-ponds, common.

Perennial. *August, September.*

Herb floating, entirely under water, dark green, copiously branched, 2 or 3 feet long, densely clothed with whorled spreading leaves, 8 in each whorl, all repeatedly cut into fine, linear, equal, acute, roughish segments. *Fl.* axillary, solitary, sessile, pale green. *Fruit* armed with 2 spreading lateral spines, and a terminal one from the elongated *style*; all very variable in length.

2. *C. submersum*. Unarmed Hornwort.

Fruit destitute of spines. Segments of the calyx acute, entire.

C. submersum. *Linn. Sp. Pl.* 1409. *Willd. v.* 4. 405. *Fl. Br.* 1020. *Engl. Bot. v.* 10. t. 679. *Fl. Dan.* t. 510.

C. demersum β . *Huds.* 419.

Hydroceratophyllum folio lævi, octo cornibus armato. *Vaill. Mem. de l'Ac. des Sc.* 299. t. 15. f. 2. *Dill. in Raii Syn.* 135.

In ditches, but rarely.

By the road from Chichester to Selsey island. *Dill.* Between Yarmouth and Gorleston. *Mr. D. Turner.*

Perennial. *September.*

Like the foregoing, but *Vaillant* observed the leaves to be smoother, and more divided, having eight segments in all, instead of four. These characters are certainly inconstant. The presence or absence of spines on the fruit, and the segments of the calyx being, as *Mr. Sowerby* first discovered, sharp and entire, not toothed, are surely sufficient distinctions. *Willdenow* declares his decided opinion that they are not varieties of each other, though he found the segments of the leaves in both species finely serrated at the ends.

438. MYRIOPHYLLUM. Water-Milfoil.

Linn. Gen. 493. *Juss.* 18. *Fl. Br.* 1021. *Vaill. Mem. de l'Ac. des Sc.* 306. t. 15. f. 3. *Gærtn. t.* 68.

Pentapterophyllum. *Dill. Gen.* 125. t. 7.

Nat. Ord. same as the last. See *Grammar*, 167. t. 19. f. 251.

Barr. fl. Cal. of 4 oblong, upright leaves; the outer one largest; inner smallest. *Pet.* 4, obovate, soon falling. *Filam.* 8, capillary, flaccid, longer than the calyx. *Anth.* oblong, vertical.

Fert. fl. below the others. *Cal.* and *Cor.* as in them. *Germ.* 4, oblong, inferior. *Styles* none. *Stigmas* downy. *Dru-*

pas 4, oblong, with a thin coat. *Nuts* solitary, with a hard thick shell, containing a solitary kernel, in a simple skin. *Gærtner*.

Gærtner observes that this genus is evidently dicotyledonous. Its natural order is no less evidently what Mr. Brown has called *Haloragææ*.

The species are all aquatic and herbaceous, with whorled, pinnatifid *leaves*, and whorled, or axillary, *flowers*, whose organs are not always altogether separated.

1. *M. spicatum*. Spiked Water-Milfoil.

Flowers in whorled, interrupted, leafless spikes.

M. spicatum. *Linn. Sp. Pl.* 1409. *Willd. v. 4.* 406. *Fl. Br.* 1021. *Engl. Bot. v. 2. t. 83.* *Hook. Scot.* 272. *Fl. Dan. t.* 681.

Pentapteris n. 993. *Hall. Hist. v. 1.* 424.

Potamogiton foliis pennatis. *Raii Syn.* 150.

Millefolium aquaticum pennatum spicatum. *Bauh. Prodr.* 73. f.

M. pennatum aquaticum. *Bauh. Hist. v. 3. p. 2.* 775. f.

Feather Pondweed. *Petiv. H. Brit. t. 6. f.* 5.

β. *Millefolium aquaticum pennatum minus, foliolis singularibus latiusculis flosculis subjectis, donatum.* *Moris. v. 3.* 622. *sect. 15. t. 4. f. 7.* *Dill. in Raii Syn.* 151.

Fine Feather Pondweed. *Petiv. H. Brit. t. 6. f.* 6.

In ditches and pools frequent.

β. In a ditch near Lodden bridge, not far from Reading. *J. Bobart.* In the river on Hounslow heath. *Doody.*

Perennial. *July, August.*

Herb smooth, floating under water, with branching, round *stems*, and dark-green, finely pinnatifid, spreading *leaves*, 4 in each whorl. *Fl.* in several whorls, rising above the surface, on simple, terminal, leafless branches, with 4 small entire *bractæas* under each whorl. *Cal.* acute, finely fringed. *Pet.* reddish.

The variety β, with one large simple obovate *leaf* under each whorl of *flowers*, if Morison's plate be correct, is very remarkable. It has not fallen in my way.

2. *M. verticillatum*. Whorled Water-Milfoil.

Flowers all axillary.

M. verticillatum. *Linn. Sp. Pl.* 1410. *Willd. v. 4.* 407. *Fl. Br.* 1022. *Engl. Bot. v. 4. t. 218.* *Fl. Dan. t.* 1046. *Ehrh. Herb.* 60.

M. aquaticum minus. *Clus. Hist. v. 2.* 252. f. *Pann.* 711. f. 712.

Pentapteris n. 992. *Hall. Hist. v. 1.* 424.

Pentapterophyllum aquaticum, flosculis ad foliorum nodos. *Dill. Giss.* 112. *append.* 126. *t. 7.* *Raii Syn.* 316.

Millefolium aquaticum minus. *Bauh. Hist. v. 3. p. 2.* 775. f.

Knotted Pondweed. *Petiv. H. Brit. t. 6. f. 8.*

In ponds and ditches, much less common than the former.

Near Cambridge. *Ray.* At Bungay, Suffolk, and Hedenham, Norfolk. *Mr. Woodward.* At Lakenham, Norwich. *Mr. Crowe.* Perennial. *July.*

Herb like the last, but the flowering part of the stem, or branches, rises above the water, covered to the top with smaller, less deeply cut, *leaves*, in the bosoms of which several whorls of *flowers* are situated, the uppermost chiefly with *stamens* only; lowermost, less numerous, with *pistils*; intermediate ones often with both. *Pet.* small, white, deciduous. *Stigmas* thick, feathery. The *leaves* are 5 in each whorl.

439. SAGITTARIA. Arrow-head.

Linn. Gen. 470. *Juss.* 46. *Fl. Br.* 1023. *Lam. t.* 776. *Gartn. t.* 84. *Sagitta.* *Dill. Gen.* 104. *t.* 4.

Nat. Ord. *Tripetaloideæ.* *Linn.* 5. *Junci, sect.* 3. *Juss.* 13. *Hydrocharideæ.* *Br. Pr.* 344.

Barr. fl. numerous. *Cal.* of 3 ovate, concave, permanent leaves. *Pet.* 3, roundish, obtuse, with short claws, flat, spreading, thrice the size of the calyx-leaves, and alternate with them, deciduous. *Filam.* numerous, about 24, awl-shaped, collected into a round head. *Anth.* vertical, heart-shaped, much shorter than the petals.

Fert. fl. fewer, below the others. *Cal.* and *Pet.* as in them. *Germ.* numerous, collected into a head, compressed, tumid externally, tapering into very short *styles*, with sharp, simple, permanent *stigmas*. *Seeds* numerous, obovate, compressed, beaked, surrounded with a vertical, dilated, compressed margin, broadest externally. "*Embryo* simple, undivided, folded." *Gærtner.*

Aquatic *herbs*, rising above the surface. *Stem* none. *Leaves* stalked, entire; arrow-shaped, or elliptical. *Fl.* large, white and handsome, in several stalked *whorls*, on a tall common stalk.

1. *S. sagittifolia.* Common Arrow-head.

Leaves arrow-shaped, acute.

S. sagittifolia. *Linn. Sp. Pl.* 1410. *Willd. v.* 4. 408. *Fl. Br.* 1023. *Engl. Bot. v.* 2. *t.* 84. *Fl. Dan. t.* 172. *Dicks. H. Sicc. fasc.* 15. 14. *Ehrh. Herb.* 140.

Sagitta. *Raii Syn.* 258. *Bauh. Hist. v.* 3. *p.* 2. 779. *f.* *Camer. Epit.* 874. *f.*

S. n. 1185. *Hall. Hist. v.* 2. 80.

S. minor. *Matth. Valgr. v. 2.* 483. *f.*

S. major et minor. *Ger. Em.* 416. *f, f.*

Narrow Arrow-head. *Petiv. H. Brit. t. 43. f. 11.*

β. *Sagitta major.* *Matth. Valgr. v. 2.* 482. *f. Camer. Epit. 875. f.*

Broad Arrow-head. *Petiv. H. Brit. t. 43. f. 10.*

γ. *Sagitta aquatica omnium minima.* *Rail Syn.* 258.

Small Arrow-head. *Petiv. H. Brit. t. 43. f. 12.*

δ. *Sagitta aquatica, foliis variis.* *Loes. Pruss. 234. t. 74.*

Grass Arrow-head. *Petiv. H. Brit. t. 43. f. 9.*

In ditches, ponds, and the margins of rivers, common; but not found in Scotland.

Perennial. *July, August.*

Root tuberous, nearly globular, with many long fibres, and throwing out bulbiferous runners, as observed by Mr. L. Wigg. *Herb* milky, smooth. *Leaves* on long, triangular, very cellular *foot-stalks*, shaped like the head of an arrow, with two sharp lobes pointing downward, and one upward, the latter occasionally less acute. Nothing is more variable than the breadth and size of the *leaves*, which are diminished almost to nothing when deeply immersed in the water, or exposed to a rapid current. Hence the above varieties mentioned by authors, but which the slightest observation will discover to be evanescent. *Fl.* 3 in each whorl, with combined *bractees* at the base of their partial *stalks*. *Pet.* snow-white, with a violet claw, quite distinct from the *calyx*, and falling off while that remains. Yet the great Jussieu decrees these *petals* to be the inner leaves of the *calyx*, because the plant is monocotyledonous; but surely this is no less erroneous than in the *Orchideæ*. It teaches no truth, for it is an arbitrary violation of common sense.

This species of *Sagittaria* appears to be a native of China and the East Indies, as well as of Europe, and perhaps of North America likewise. Representations of it, that cannot be mistaken, often occur on oriental porcelain, associated with the consecrated *Cyamus*, or Sacred Bean, whose history is given in *Exot. Bot. v. 1.* 59. The late Mr. Payne Knight, so distinguished for his profound learning, suggested to me, that, as the *Cyamus* is an acknowledged emblem of fertility and reproduction, the Arrow-head indicates the contrary, or a destroying power. They are the egg, and the anchor, or arrow-head, so general in architectural ornaments.

440. ARUM. Cuckow-pint.

Linn. Gen. 470. *Juss.* 24. *Fl. Br.* 1023. *Tourn. t.* 69. *Lam. t.* 740. *Gærtn. t.* 84.

Nat. Ord. *Piperitæ.* *Linn. 2. Aroideæ.* *Juss.* 7.

Common Cal. of one, upright, sheathing, oblong leaf; con-

volute at the base; converging above; contracted towards the middle; coloured within; containing the *flowers* and their *common stalk*; the latter terminating above in a coloured, nearly cylindrical, naked appendage, finally withering. *Cor.* none.

Barr. fl. Filam. numerous, very short and thick, disposed in a dense ring, of several rows, round the *stalk*, within the convoluted part of the calyx, and surmounted, at a small distance above, by another aggregate ring, of apparently abortive, slender-pointed, filaments. *Anth.* of 2 lateral, elliptic-oblong, single-celled lobes, opening by solitary pores.

Fert. fl. Germ. sessile, obovate, rather more numerous, in a dense compound ring, round the lower part of the stalk, at a small distance from the barren flower. *Styles* none. *Stigm.* downy. *Berry* juicy, globose, of 1 cell. *Seeds* several, roundish, or angular, with a simple *embryo*.

Smooth *herbs*, acrid until they are dried, rarely caulescent.

Leaves either arrow-shaped, or many-lobed. *Fl.* solitary, in some species very fetid.

1. *A. maculatum*. Common Cuckow-pint, or Wake Robin.

Stem none. Leaves halberd-shaped, entire. Common stalk of the flowers club-shaped, obtuse.

A. maculatum. Linn. *Sp. Pl.* 1370. Willd. v. 4. 483. *Fl. Br.* 1024. *Engl. Bot.* v. 19. t. 1298. Hook. *Scot.* 272. *Curt. Lond. fasc.* 2. t. 63. *Woodv. t.* 25. *Mill. Illustr. t.* 76. *Fl. Dan. t.* 505. *Bull. Fr. t.* 25.

Arum. *Raii Syn.* 266. *Riv. Monop. Irr. t.* 124. *Fuchs. Hist.* 69. f. *Ic.* 40. f. *Matth. Valgr. v.* 1. 545. f. *Camer. Epit.* 365, 366. f, f. *Du Gort, Benef. Comm.* 18. f.

A. n. 1302. *Hall. Hist. v.* 2. 160.

A. vulgare. *Ger. Em.* 834. f. *Mill. Ic.* 35. t. 52. f. 1.

A. officinarum. *Lob. Ic.* 597. f.

Δρακοντεια μικρη. *Diosc. Ic. t.* 131.

In groves, bushy places, borders of fields, and hedge banks, common.

Perennial. *May.*

Root tuberous; when fresh, mucilaginous and acrid; when dried, affording plenty of white, wholesome, nutritious flower, fit for making bread. *Herb* of a shining green. *Stem* none. *Leaves* stalked, broadly arrow-shaped, more or less hastate, acute, erect, spotted variously with black. *Flowers* solitary, on a simple radical stalk, erect, pale green, with a red tint, and some occa-

MONOECIA—POLYANDRIA. Poterium. 147

sional spots; the naked summit of the *stalk* within dark purple, reported to give out, at the time of its perfection, a considerable degree of heat. *Berries* scarlet, internally viscid, remaining long after the *leaves* and all parts of the *flower* have disappeared.

441. POTERIUM. Salad-Burnet.

Linn. Gen. 495. *Juss.* 336. *Fl. Br.* 1024. *Lam. t.* 777.

Pimpinella. Tourn. t. 68. *Gærtn. t.* 32.

Nat. Ord. Senticosæ. Linn. 35. *Rosaceæ. Juss.* 92. See *Grammar* 172.

Gærtner, like Haller, unites this genus with *Sanguisorba*. v. 1. 217.

Barr. fl. Cal. of 3 ovate, coloured, spreading, deciduous leaves. *Cor.* of 1 petal, tubular, in 4 deep ovate, concave, spreading segments, permanent. *Filam.* numerous, 30—50, capillary, flaccid, much longer than the corolla. *Anth.* roundish, 2-lobed.

Fert. fl. above the others. *Cal.* as in them. *Cor.* of 1 petal, wheel-shaped; tube short, roundish, closed at the mouth; limb in 4 deep, ovate, flat, reflexed segments, permanent. *Germ.* 1 or 2, ovate-oblong, within the tube, each of 2 cells, and crowned with a capillary, coloured *style*, much longer than the limb. *Stigm.* radiated, coloured. *Nut* invested with the dry tube of the corolla, angular, rugged, of 1 or 2 cells. *Kernels* oval, solitary.

Herbs or *shrubs*, sometimes thorny. *Leaves* pinnate; serrated or cut. *Fl.* in heads, or spikes, terminal.

1. *P. Sanguisorba.* Common Salad-Burnet.

Thorns none. Stem somewhat angular.

P. Sanguisorba. Linn. Sp. Pl. 1411. *Willd. v.* 4. 421. *Fl. Br.* 1025. *Engl. Bot. v.* 12. t. 860. *Hook. Scot.* 273. *Curt. Lond. fasc.* 2. t. 64. *Mart. Rust. t.* 69. *Dicks. H. Sicc. fasc.* 9. 15.

Sanguisorba minor. Raii Syn. 203. *Bauh. Hist. v.* 3. p. 2. 115. f. 116. *Fuchs. Hist.* 789. f. *Ic.* 457. f.

Pimpinella. n. 706. *Hall. Hist. v.* 1. 312.

P. hortensis. Ger. Em. 1045. f.

P. sive Sanguisorba minor. Matth. Valgr. v. 2. 381. f. *Camer. Epit.* 777. f.

P. minor. Dalech. Hist. 1087. f.

Sideritis secunda Dioscoridis. Column. Ecphr. 123. f. 124.

On chalky hills, or about limestone rocks, abundantly.

Perennial. *July.*

Root woody. *Stems* branched, herbaceous, angular, smooth, leafy, many-flowered, 1 to 2 feet high. *Leaves* pinnate, of several pairs of rounded, neatly serrated, veiny *leaflets*, with an odd one, all of a deep, somewhat glaucous, green, smooth, but not shining. *Stipulas* joined to the base of the footstalks in pairs, sharply cut. *Spikes*, or *heads*, globose; of many fertile *flowers* in the upper part, which is remarkable; and a smaller number of barren ones below, whose crimson *stamens* resemble elegant silk tassels. *Nut* quadrangular, wrinkled.

The *leaves* taste and smell like Cucumber, and give that flavour to salads, for which purpose this plant is very generally cultivated.

442. QUERCUS. Oak.

Linn. Gen. 495. *Juss.* 410. *Fl. Br.* 1025. *Tourn. t.* 349. *Lam. t.* 779. *Gærtn. t.* 37.

Nat. Ord. *Amentaceæ*. *Linn.* 50. *Juss.* 99. Four following genera the same.

Barr. fl. in a loose *catkin*, deciduous. *Cal.* a *scale* of 1 leaf, in 4, 5, or more, deep, often divided, segments. *Cor.* none. *Filam.* several, about 8 or more, short, awl-shaped. *Anth.* roundish, of 2 channelled lobes.

Fert. fl. separate. *Cal.* double, both permanent; outer one inferior, hemispherical, coriaceous, single-flowered, entire, much enlarged in the fruit, and externally scaly, or tuberculated; inner superior, of 1 leaf, in 6 minute, deep, sharp, downy segments, closely surrounding the base of the style. *Cor.* none. *Germ.* 1, below the inner calyx, globose, of 3 cells, with rudiments of 2 seeds in each. *Style* solitary, short, conical. *Stigm.* 3, obtuse, recurved. *Nut* solitary, oval, coriaceous, not bursting, of 1 cell, attached by a broad *scar* to the inside of the outer calyx. *Kernel* solitary, rarely 2, with large half-ovate *cotyledons*, without any separate *albumen*; *embryo* at the top of the seed.

Large *trees*, with simple, alternate, deciduous or evergreen, *leaves*, and small axillary *flowers*; the *wood* more or less valuable in different species; the *bark* useful for tanning.

1. *Q. Robur*. Common British Oak.

Leaves deciduous, oblong, wider towards the extremity; their sinuses rather acute; lobes obtuse. *Fruit-stalks* elongated.

Q. Robur. *Linn. Sp. Pl.* 1414. *Fl. Suec.* 340, α . *Fl. Br.* 1026.

Engl. Bot. v. 19. t. 1342. Hook. Scot. 373. Woodv. t. 126. Huds. 421, α. Mart. Rust. t. 10; the stalked variety.

Q. pedunculata. Willd. Sp. Pl. v. 4. 450. Baumz. 278. Ait. H. Kew. ed. 2. v. 5. 294. Ehrh. Arb. 77. Pl. Off. 168.

Q. fœmina. With. 387. Fl. Dan. t. 1180.

Q. n. 1626, α, major. Hall. Hist. v. 2. 296.

Q. latifolia. Raii Syn. 440.

Q. vulgaris. Ger. Em. 1339, 1340. f, f. Lob. Ic. v. 2. 154, 155. f, f.

Q. Hemeris. Dalech. Hist. 4. f.

Q. cum longo pediculo. Bauh. Pin. 420. Duham. Arb. v. 2. 202. t. 47.

Quercus. Trag. Hist. 1102. f. Fuchs. Hist. 229. f. Ic. 130. f. Matth. Valgr. v. 1. 184. f. Camer. Epit. 111. f. Tabern. Kreuterb. 1374. f.

Oak Tree. Hunt. Evel. Sylv. 69. f.

In woods and hedges every where. In mountainous situations of more humble stature.

Tree. *April.*

A large, umbrageous, very handsome *tree*, with round, smooth, leafy, more or less wavy, *branches*. *Leaves* deciduous, alternate, on short stalks, smooth, bright green, unequally cut into parallel, bluntish, entire, marginal lobes, with rather acute sinuses, and furnished with a single mid-rib, sending off veins into the lobes. Barren *fl.* in numerous, pendulous, stalked, yellowish, downy, deciduous *catkins*, 2 inches long, from lateral scaly *buds*. Fertile on axillary simple stalks, few, scattered, sessile, lateral, small, greenish tinged with brown; their *outer calyx* subsequently much enlarged and hardened, constituting the well-known permanent cup of the smooth, finally deciduous, *nut*, or *acorn*, which last is crowned by the small, chaffy, converging *inner calyx*.

Acorns, the noted food of hogs, are eaten likewise by pheasants; probably by turkeys in a half domesticated state. We have known a considerable number taken out of the crop of one pheasant, which, on being planted, grew. The value of the *wood*, as the most useful for all the most important purposes, is well known. When finely veined, it is no less ornamental. This species of Oak, affording the best, strongest, and most lasting timber, received from Linnæus the classical name of *Robur*, appropriated to the hardest and best kind of Oak. How Willdenow came to misapply this specific appellation to the following, or worst kind, and why he is countenanced in this wilful error in the *Hort. Kew.*, contrary to the knowledge of all botanists, I am not able to give any satisfactory reason. Reichard seems the original cause, in the misapplication of the references to Linnæus, in his *Syst. Plant. v. 4. 163.*

2. *Q. sessiliflora*. Sessile-fruited Oak.

Leaves on elongated stalks, deciduous, oblong; with opposite, acute sinuses. Fruit sessile.

Q. sessiliflora. *Salisb. Prodr.* 392. *Fl. Br.* 1026. *Engl. Bot.* v. 26. t. 1845. *Hook. Scot.* 273.

Q. sessilis. *Ehrh. Arb.* 87.

Q. Robur. *Willd. Sp. Pl.* v. 4. 450. *Baumz.* 277. *Huds.* 421, β . *Mart. Rust.* t. 11. *sessile variety*.

Q. latifolia mas, quæ brevi pediculo est. *Raii Syn.* 440.

Q. platyphyllos. *Dalech. Hist.* 3. f.

β . *Durmast Oak*. *Mart. Rust.* t. 12.

In woods, less common than the foregoing.

In Bagley wood, and divers other places, first observed by Mr. Bobart. *Ray*. In many parts of Norfolk; also about London.

β . In the New Forest, Hampshire. *Martyn*. *Sussex*. *Mr. Borrer and Mr. Lyell*.

Tree. *April, May*.

The wood of this species being far inferior to the true *Q. Robur* in quality, it is highly important to distinguish them, though long considered as varieties. The leaves of the present have longer, more slender, footstalks, and are more equally and regularly pinnatifid; in the variety β they are downy underneath, and generally thought more lasting, or inclined to be evergreen. The most clear and indisputable specific character, noticed by the older writers, consists in the fertile flowers having little or no stalks, which difference exists likewise in the Acorns. Those writers however do not appear to have been aware of the inferior value of the timber. Professor Martyn has given some remarks on this subject, highly worthy of notice.

443. FAGUS. Beech and Chesnut.

Linn. Gen. 496. *Juss.* 409. *Fl. Br.* 1027. *Tourn.* t. 351. *Lam.* t. 782. *Gærtn.* t. 37.

Castanea. *Tourn.* t. 352. *Gærtn.* t. 37.

Nat. Ord. see n. 442.

Barr. fl. either few, in a short roundish catkin; or numerous, in a long cylindrical one. *Cal.* of one leaf, in 5 or 6 segments. *Cor.* none. *Filam.* 5—20, or more, capillary, longer than the calyx. *Anth.* roundish, or oblong, of 2 lobes.

Fert. fl. stalked. *Cal.* double, both permanent; outer one inferior, coriaceous, externally prickly, in 4, 5, or 6 deep segments, containing 2 or 3 flowers; inner superior, of 1 leaf, in 5 or 6 deep segments, internally woolly. *Cor.*

none. *Germ.* 2 or 3, below the inner calyx, ovate, more or less compressed or angular, of 3 or 6 cells, with rudiments of 2 seeds in each. *Styles* 3 or 6, short. *Stigm.* oblong, undivided, spreading or erect, permanent. *Nuts* 2 or 3, ovate, more or less angular, coriaceous, not bursting, of 1 cell, attached to the base of the outer calyx, and crowned with the inner one. *Kernels* 1, 2, or 3, with large, furrowed, or plaited *cotyledons*, without any separate *albumen*; *embryo* at the top of the seed.

Large trees, with hard wood, and stalked, alternate, simple, deciduous, more or less serrated, or wavy, *leaves*. *Fl.* from axillary buds.

1. *F. Castanea*. Sweet Chesnut.

Leaves lanceolate, sharply serrated; smooth beneath. Prickles of the outer calyx compound and entangled. Stigmas six.

F. Castanea. *Linn. Sp. Pl.* 1416. *Fl. Br.* 1027. *Engl. Bot. v.* 13. t. 886. *Willd. Baumz.* 111. *Ehrh. Arb.* 129.

Castanea. *Raii Syn.* 440. *Bauh. Hist. v. 1. p. 2.* 121. f. *Trag. Hist.* 1100. f. *Fuchs. Hist.* 377. f. *Ic.* 214. f. *Matth. Valgr. v. 1.* 191. f. *Camer. Epit.* 118. f. *Duham. Arb. v. 1. t.* 50. *Dod. Pempt.* 814. f. *Ger. Em.* 1442. f.

C. vesca. *Gærtn. v. 1.* 181. t. 37. f. 1. *Willd. Sp. Pl. v. 4.* 460.

C. vulgaris. " *DeCand. Fl. Gall. Syn.* 181." *Hook. Scot.* 273.

C. n. 1623. *Hall. Hist. v. 2.* 292.

C. sativa. *Mill. Ic.* 56. t. 84.

Chesnut tree. *Hunt. Evel. Sylv.* 159. f.

In woods; whether wild or not has been doubted, but it appears to be so in the south and west of England, and has been employed in some of our oldest buildings.

Tree. *May*.

A stately and majestic tree, rivalling, if not exceeding, the British Oak in size and duration. The *bark* is remarkable for its deep and wide clefts, which seem to have furnished ideas for some ornaments in Gothic architecture. *Branches* widely spreading; round and smooth when young. *Leaves* near a span long, elliptic-lanceolate, acute, smooth, with many transverse veins, ending in sharp serratures; of a rich shining green above; paler beneath. *Barren catkins* numerous, axillary, solitary, yellow, pendulous, almost as long as the leaves, deciduous. *Fl.* ranged along the common stalk in lateral sessile tufts. *Stam.* numerous, spreading. *Fert. fl.* much fewer, on terminal stalks, which are lengthened out as the fruit advances. *Styles* about 6, with long, smooth, upright *stigmas*. Gærtner detected about 12 scarlet

rudiments of *stamens*, among the wool at the base of the styles. *Nuts* large, broadly ovate, generally 2, flat on the inner side, attached by a broad *scar* to the bottom of the greatly enlarged outer calyx, whose outside is copiously armed with complicated sharp prickles.

Chesnuts afford a wholesome and grateful food to many quadrupeds, as well as to mankind. Cultivation renders them larger, but the wild sort is equally good.

2. *F. sylvatica*. Common Beech.

Leaves ovate, obsoletely serrated. Prickles of the outer calyx simple. Stigmas three.

F. sylvatica. Linn. *Sp. Pl.* 1416. Willd. *v.* 4. 459. Baumz. 113. *Fl. Br.* 1028. *Engl. Bot.* *v.* 26. *t.* 1846. Hook. *Scot.* 274. Sibth. *Oxon.* 152. *Fl. Dan.* *t.* 1283.

F. n. 1622. Hall. *Hist.* *v.* 2. 292.

Fagus. Raii *Syn.* 439. Bauh. *Hist.* *v.* 1. *p.* 2. 117. *f.* 118. Trag. *Hist.* 1107. *f.* Matth. *Valgr.* *v.* 1. 185. *f.* Camer. *Epit.* 112. *f.* Dod. *Pempt.* 832. *f.* Ger. *Em.* 1444. *f.*

Beech tree. Hunt. *Evel. Sylv.* 136. *f.*

In woods, especially on chalky hills. It is remarkable, as Ray observes, that Cæsar asserts there is no Beech timber in Britain. *Comm. de Bello Gallico*, book 5. *sect.* 10.

Tree. April, May.

A handsome umbrageous tree, with a smooth bark, and shining leaves, which remain during winter, in a dry state, on the branches, and are very long in decaying after their fall. Hence they form a thick bed, through which grasses, and herbaceous plants in general, perhaps, do not readily penetrate; though *Orchideæ*, and some parasitical vegetables, flourish most in Beech woods. Seedlings of this tree, with their pale *cotyledons*, look not unlike some kinds of *Fungus*. The leaves are 2 or 3 inches long, slightly and unequally serrated, with a silky marginal fringe, and downy veins. Barr. *fl.* brown, 3 or 4 in each round, stalked, drooping head, or catkin. Fertile ones above them, solitary, on stouter stalks. Cal. of the fruit 4-cleft, clothed with simple pliant prickles. Stigmas 3 in each flower, spreading, acute, downy. Nuts 2, with 3 equal, very sharp, angles, and crowned with the inner calyx, as Gærtner properly, I now think, denominates it. I have profited of the light thrown by this learned botanist upon *Quercus*, *Fagus*, and their allies, though I cannot concur with him in separating *Castanea* from *Fagus*. No genus, I think, can be more natural than *Fagus*, as established by Linnæus. There is no shadow of a character to distinguish *Castanea*, but number in the parts of fructification, which, in this tribe, is of all things most uncertain; see *Introd. to Botany*, ed. 5. 383. I “condemn” nobody; but Gærtner, like

all botanists devoted to one object, as he was to *fruits* and *seeds*, mostly attach too universal and exclusive importance to such parts, in botanical discrimination. A good judge should contemplate the whole fructification and habit impartially, learning from thence the limits of a genus, and not making technical characters form the genus, as is now too often done; witness some able French writers on *Orchideæ*, and a thousand unlearned ones on every side. Willdenow cannot however pass unblamed for naming *corolla* in *Castanea*, what is evidently as truly a *calyx* as in his *Fagus*. Could he really aim at making only a more plausible generic character?—Dr. Hooker very properly corrects him.

The *nuts*, termed Beech Mast, are the food of hogs, and of various small wild quadrupeds. By pressure they yield a sweet oil, fit for many purposes, but which has, I know not why, disappointed several speculators who aimed at making it a source of pecuniary advantage.

444. BETULA. Birch.

Linn. Gen. 485. *Juss.* 409. *Fl. Br.* 1011. *Comp. ed.* 4. 157. *Tourn.* t. 360. *Lam. t.* 760. *Gærtn. t.* 90.

Nat. Ord. see *n.* 442.

Barr. fl. *Catkin* cylindrical, lax, imbricated all round, with ternate, concave *scales*; the middle one largest, ovate. *Cor.* none. *Filam.* 10—12, shorter than the middle scale, to which they are attached. *Anth.* roundish, 2-lobed.

Fert. fl. *Catkin* similar, but more dense; *scales* horizontal, peltate, dilated outwards, 3-lobed, 3-flowered. *Cor.* none. *Germ.* compressed, bordered, of 2 cells. *Styles* 2, awl-shaped, downy. *Stigm.* simple. *Nut* oblong, deciduous, winged at each side, of 1 cell, with a solitary *kernel*.

Trees or *shrubs*, very hardy, with round, slender *branches*; scattered, stalked, simple, serrated, deciduous *leaves*; and a hard, often veiny, *wood*. *Bark*, in several species, of many fine, soft, membranous layers.

1. *B. alba*. Common Birch. β . Weeping Birch.

Leaves ovate, acute, somewhat deltoid, unequally serrated, nearly smooth.

B. alba. *Linn. Sp. Pl.* 1393. *Willd. v.* 4. 462. *Fl. Br.* 1012. *Engl. Bot. v.* 31. t. 2198. *Hook. Scot.* 274. *Fl. Dan. t.* 1467.

B. n. 1628. *Hall. Hist. v.* 2. 299.

B. pubescens. *Ehrh. Arb.* 67. *Pl. Off.* 338.

154 MONOECIA—POLYANDRIA. *Betula*.

Betula. *Raii Syn.* 443. *Trag. Hist.* 1113. *f. Bauh. Hist.* v. 1. p. 2. 149. *f. Matth. Valgr.* v. 1. 128. *f. Camer. Epit.* 69. *f. Dod. Pempt.* 839. *f. Ger. Em.* 1478, *f. Lob. Ic.* v. 2. 190. *f.*

β. *B. pendula*. *Roth Germ.* v. 1. 405. v. 2. p. 2. 476.

B. verrucosa. *Ehrh. Arb.* 96. *Pl. Off.* 328.

B. pendulis virgulis. *Loes. Pruss.* 26.

In woods, especially in moist, heathy, or mountainous situations, on a turfy soil over sand, as Ray observes.

Tree. *April, May.*

One of the most hardy of *trees*, conspicuous in plantations for its white scaly *cuticle*, and when old, for the deep black clefts of its *bark*. The *wood* is hard, tough, and white. *Branches* long and slender, especially in old trees; in β, which is hardly a permanent variety, they droop more, and are minutely warty. *Leaves* ovate, or slightly deltoid, taper-pointed, unequally, or rather doubly, serrated; a little downy underneath, though not so in β; and assuming a golden colour in autumn. *Catkins* terminal, stalked, pendulous; the fertile ones falling all to pieces when ripe, scattering the numerous winged *seeds*.

The *branches* of this tree make the best brooms. The *wood* is useful for many purposes. Its sap contains much sugar, and ferments into a kind of rustic wine, if obtained from wounds in the trunk, before the *leaves* appear.

2. *B. nana*. Dwarf Birch.

Leaves orbicular, crenate, reticulated with veins beneath.

B. nana. *Linn. Sp. Pl.* 1394. *Am. Acad.* v. 1. 1. t. 1. *Fl. Lapp.* ed. 2. 274. t. 6. f. 4. *Willd. Sp. Pl.* v. 4. 465. *Fl. Br.* 1012. *Engl. Bot.* v. 33. t. 2326. *Lightf.* 575. t. 25. *Hook. Scot.* 274. *Pall. Ross.* v. 1. p. 1. 63. t. 40. f. D, G. *Fl. Dan.* t. 91. *Dicks. H. Sicc. fasc.* 8. 16. *Ehrh. Arb.* 18. *Gagnebin Act. Helvet.* v. 1. 58. *Lind. Wiksb.* 5.

B. nana suecorum. *Bromel. Chl. Goth.* 11. *Linn. Act. Suec.* 1735. 15.

B. n. 1629. *Hall. Hist.* v. 2. 300.

B. n. 259. *Amm. Ruthen.* 180.

B. palustris pumila, *foliis parvis rotundis*. *Cels. Act. Suec.* 1732. 3.

In spongy bogs, in the mountainous parts of Scotland.

Found by Sir James Nasmyth, Bart. in Tweeddale. *Huds.* In Breadalbane, and Ross-shire; also in the Lowlands. *Lightf.* On Ben Lawers; Mr. Winch. *Hooker.*

Shrub. *May.*

Stem bushy, 2 or 3 feet high, with copious *branches*, slightly downy when young; beset with numerous, little, round, firm, smooth, sharply crenate *leaves*, beautifully reticulated with veins, especially beneath, and furnished with short *footstalks*, having a pair of brown lanceolate *stipulas* at their base. *Catkins* erect, stalked,

cylindrical, obtuse; the barren ones lateral; fertile terminal. *Scales* of the latter 3-lobed, 3-flowered, permanent. *Stigmas* red.

Few plants are more important to the inhabitants of any country than this is to the poor hardy Laplanders, out of whose limits it was scarcely known, till Linnæus rendered it celebrated. His history of the plant, in the *Amæn. Acad.* and *Fl. Lapp.* is complete. Frequent mention of the Dwarf Birch occurs likewise in his *Lapland Tour*, published at London in 1811.

445. CARPINUS. Hornbeam.

Linn. Gen. 497. *Juss.* 409. *Fl. Br.* 1029. *Tourn. t.* 348. *Lam. t.* 780. *Gärtn. t.* 89.

Nat. Ord. see n. 442.

Barr. fl. *Catkin* cylindrical, lax, imbricated every way, with ovate, acute, concave, fringed, single-flowered *scales*, accompanied by 3 small inner ones. *Cor.* none. *Filam.* 10 or more, capillary, much shorter than the scale. *Anth.* roundish, compressed, of 2 lobes.

Fert. fl. in a bracteated *cluster*, aggregate. *Cal.* double; outer one inferior, of several oblong, deciduous, unequal, upright scales, 2- or 3-flowered; inner superior, in 3 deep, erect, sharp segments, permanent. *Cor.* none. *Germ.* ovate, crowned by the inner calyx, externally tumid and ribbed. *Styles* very short, permanent. *Stigm.* 2, awl-shaped, erect, deciduous. *Nut* ovate, angular, coriaceous, not bursting, of 1 cell, crowned by the inner calyx, and base of the style. *Kernel* 1, "with flat, fleshy, obovate *cotyledons*, without any separate *albumen*; *embryo* at the top of the seed, with a very minute *plumula*." *Gärtner*.

Trees of humble stature, with hard *wood*; alternate, stalked, simple, ovate, serrated, plaited, veiny, deciduous *leaves*; and drooping, solitary *catkins* of barren *flowers*; the fertile ones in drooping, bracteated *clusters*, resembling *catkins*; their *bracteas* subsequently much enlarged, permanent, enveloping the *nuts*. The analogy of other genera, in this natural order, justifies the foregoing view of the flowers of *Carpinus*, which is different from that given by Linnæus and others. See *Engl. Bot.* 2032.

1. *C. Betulus*. Common Hornbeam.

Bracteas of the fruit flat, oblong, serrated, with two lateral lobes.

156 MONOECIA—POLYANDRIA. *Corylus*.

C. Betulus. *Linn. Sp. Pl.* 1416. *Willd. v.* 4. 467. *Fl. Br.* 1029.
Engl. Bot. v. 29. *t.* 2032. *Hook. Scot.* 274. *Fl. Dan. t.* 1345.

C. n. 1627. *Hall. Hist. v.* 2. 298.

Carpinus. *Matth. Valgr. v.* 1. 131. *f. Camer. Epit.* 71. *f. Dod. Pempt.* 841. *f.*

Ostrya Ulmo similis, fructu in umbilicis foliaceis. *Bauh. Pin.* 427.
Raii Syn. 451.

Ornus. *Trag. Hist.* 1109. *f.*

Fagus sepium, vulgò *Ostrys Theophrasti*. *Bauh. Hist. v.* 1. *p.* 2.
 146. *f.*

Betulus. *Lob. Ic. v.* 2. 190. *f.*

B. sive Carpinus. *Ger. Em.* 1479. *f.*

In woods and hedges, on a meagre, damp, tenacious soil.

It makes a principal part of the antient forests on the north and east sides of London, as Epping, Finchley, &c.

Tree. *May*.

A rigid tree, of humble growth, patient of cropping, and well suited for cut edges, or covered walks, in gardens of the old style, some of which may still be seen, attached to several old English mansions. The wood is, as Gerarde says, of a horny toughness and hardness; the bark smooth and whitish, or light grey. Leaves resembling those of an elm, but smooth, doubly serrated, pointed, about 2 inches long, plaited when young, having numerous, parallel, transverse, hairy ribs. *Stipulas* oblong, obtuse, smooth, reddish, deciduous. *Catkins* and *clusters* terminal, solitary, drooping; the latter becoming greatly enlarged, with permanent, dilated, stalked, unequally 3-lobed, sharply serrated, veiny, dry, pale-green *bracteas*, each enveloping an angular nut scarcely bigger than a grain of barley.

When standing by itself, and allowed to take its natural form, the Hornbeam makes a much more handsome tree than most people are aware of.

446. CORYLUS. Hasel-nut.

Linn. Gen. 498. *Juss.* 410. *Fl. Br.* 1030. *Tourn. t.* 347. *Lam. t.* 780. *Gærtn. t.* 89.

Nat. Ord. see *n.* 442.

Barr. fl. *Catkin* cylindrical, imbricated every way. *Scales* single-flowered, imbricated, much contracted at the base, in 3 deep, ovate, concave segments, the middle one largest, lying over the others. *Cor.* none. *Filam.* 8, or more, hanging from the under side of each scale, capillary, rather short. *Anth.* roundish, compressed, of 2 cells, pendulous, not extending beyond the scale.

Fert. fl. from remote scaly buds, aggregate. *Outer calyx* inferior, of 1 leaf, deeply divided, many-flowered, subse-

quently much enlarged, permanent; *inner* superior, very minute, obsolete, deciduous. *Cor.* none. *Germ.* very small, ovate, with rudiments of 2 seeds. *Styles* 2, very short. *Stigmas* prominent, awl-shaped, coloured, finely downy, deciduous. *Nut* ovate, with a broad scar, bony, not bursting, a little compressed and downy at the top, scarcely pointed, of 1 cell, internally spongy or filamentous, invested with the greatly enlarged, coriaceous, jagged, downy outer calyx, whose base is succulent. *Kernel* solitary, rarely 2, ovate, with large, half-ovate *cotyledons*, without a separate *albumen*; *embryo* oblong, at the top of the seed.

Small *trees*, more or less downy, with round *branches*, and stalked, alternate, roundish, serrated, deciduous *leaves*, coming after the naked *catkins* and *flower-buds*. *Nuts* eatable. The forms and proportions of the *calyx* of the fruit, I think, indicate distinct species, permanent from seed.

1. *C. Avellana*. Common Hasel-nut, or Stock-nut.

Stipulas ovate, obtuse. Leaves roundish, heart-shaped, pointed. Young branches hairy. Calyx shorter than the nut.

C. Avellana. *Linn. Sp. Pl.* 1417. *Willd. v.* 4. 470. *Fl. Br.* 1030. *Engl. Bot. v.* 11. t. 723. *Hook. Lond. t.* 17. *Scot.* 275. *Fl. Dan. t.* 1468. *Ehrh. Pl. Off.* 198.

C. n. 1625. *Hall. Hist. v.* 2. 295.

C. sylvestris. *Raii Syn.* 439. *Ger. Em.* 1438. *f. Lob. Ic. v.* 2. 192. *f.*

Nux Avellana. *Matth. Valgr. v.* 1. 255. *f. right hand part. Camer. Epit.* 177. *f.* 2.

Avellana nux sylvestris. *Fuchs. Hist.* 398. *f. Ic.* 225. *f.*

Hasel-nut tree. *Hunt. Evel. Sylv.* 220. *f.*

In hedges and copses every where.

Tree. *March, April.*

A small bushy *tree*, with copious *branches*, hairy, or glandular, when young. *Leaves* 2 or 3 inches wide, doubly serrated, light green, downy, especially beneath. Barren *catkins* terminal, clustered, or paniced, greyish, long and pendulous, opening in the early spring, before the leaves appear, and indeed formed during the preceding autumn. The ovate scaly *buds*, containing the fertile *flowers*, become conspicuous at the same time, by their tufts of crimson *stigmas*. The *nuts*, 2 or 3 from each bud, are sessile, roundish-ovate, half covered by the jagged outer *calyx* of their respective *flowers*, greatly enlarged, and permanent.

The wood is reported to make excellent charcoal for drawing, of the preparation of which, and of the whole history of this plant, Dr. Hooker gives a full account, annexed to an admirable figure. The cheat of the divining rod, for finding water, revived in our days, is best forgotten; like another even more impudent cheat, of seeing with the fingers' ends.



MONOECIA MONADELPHIA.

447. PINUS. Fir.

Linn. Gen. 499. Juss. 414. Fl. Br. 1031. Tourn. t. 355, 356.
Lam. t. 786. Gærtn. t. 91.

Nat. Ord. *Coniferæ*. Linn. 51. Juss. 100.

Barr. fl. Catkin deciduous, of numerous, naked, spreading stamens, connected by one common stalk. *Cal.* none. *Cor.* none. *Filam.* very short. *Anth.* erect, wedge-shaped, of 2 cells, bursting lengthwise at each side, crowned with a jagged, membranous crest.

Fert. fl. Catkin ovate, or roundish, of numerous, imbricated, close, rigid, permanent, 2-flowered, 2-lipped scales. *Cal.* none. *Cor.* none. *Germ.* 2, at the base of each scale within. *Style* 1 to each germen. *Stigm.* prominent, obtuse, evanescent. *Cone* ovate, hard and woody, of numerous rigid, peltate, permanent scales, finally starting asunder. *Seeds* 2 to each scale, oval, each crowned with a large, terminal, half rounded, membranous wing, shorter than the scale.

Long-lived, hardy, resinous trees, frequently evergreen, though mostly of a dark and gloomy aspect. *Leaves* linear, very narrow, 2 or more from each bud. *Barren fl.* terminal, aggregate, yellow, with abundant pollen. *Fert. fl.* on lateral stalks. *Bractes* several at the base of each catkin, imbricated, scaly.

The pistils and stigmas have not generally been well understood or described. The Rev. J. Holme, F.L.S., has demonstrated to me the stigmas of the *Pinus Larix*, and has found them also in our only British *Pinus*, the Scotch Fir. To him I am obliged for this part of the generic character.

1. *P. sylvestris*. Scotch Fir.

Leaves rigid, in pairs. Young cones stalked, recurved.
Crest of the anthers very small.

P. sylvestris. Linn. *Sp. Pl.* 1418. Willd. *v.* 4. 494. *Fl. Br.* 1031.
Engl. Bot. *v.* 35. *t.* 2460. Hook. *Scot.* 275. Lam. *Pin.* 1. *t.* 1.
Woodv. *t.* 207. Mill. *Illustr.* *t.* 82. Pall. *Ross.* *v.* 1. *p.* 1. 5. *t.* 2.
f. 1, i. Ger. *Em.* 1356. *f.* Dalech. *Hist.* 44. *f.* Ehrh. *Pl. Off.* 139.

P. n. 1660. Hall. *Hist.* *v.* 2. 317.

P. n. 1661. Hall. *Nomencl.* 153.

P. sylvestris, foliis brevibus glaucis, conis parvis albertibus. Raii
Syn. 442. Duham. *Arb.* *v.* 2. 125. *t.* 30. *Engl. Gard. Cat.* 57.
t. 17.

P. sylvestris montana. Matth. *Valgr.* *v.* 1. 89. *f.* Camer. *Epit.* 40. *f.*

P. sylvestris vulgaris. Bauh. *Hist.* *v.* 1. *p.* 2. 253. *f.*

Scotch Fir. Hunt. *Evel. Sylv.* 266. *f.*

In the Highlands of Scotland, in vast natural forests. *Lightf.*

Tree. *May*.

A tall, straight, hardy, long-lived tree, determinately branched ; the bark scaling off in thick portions ; the wood, or Red Deal, highly useful for building. Turpentine is the natural exudation of the tree, either spontaneously, or from wounds in the trunk. Tar and pitch are obtained by means of fire, or boiling. The leaves grow 2 together, from scaly buds disposed in a quincunx, and are linear, straight, smooth ; channelled above ; convex beneath. Catkins accompanied with many scaly bractes. Cones tuberculated, tessellated, about 2 inches long, useful only for fuel. They might perhaps serve, like the bark, for tanning.

Class XXII. DIOECIA.

*Stamens and Pistils in separate flowers,
on different plants.*

(MONANDRIA. Stamen 1.)

Several *Salices*.

Order I. DIANDRIA. Stamens 2.

448. SALIX. *Barr. fl. Catkin imbricated. Cal. a scale. Petals none. Nect. 1 or more glands, at the base. Stam. 1—5.*
Fert. fl. Catkin imbricated. Cal. a scale. Pet. none. Nect. as in the barren fl. Stigm. 2. Capsule superior, of 1 cell, and 2 valves. Seeds tufted.

Order II. TRIANDRIA. Stam. 3.

449. EMPETRUM. *Barr. fl. Cal. in 3 deep segments. Pet. 3. Stam. capillary, 3—9.*
Fert. fl. Cal. in 3 deep segments. Pet. 3. Stigm. 9. Berry superior, with 9 seeds.
450. RUSCUS. *Barr. fl. Cal. of 6 leaves. Pet. none. Nect. ovate, tubular, bearing the stamens internally.*
Fert. fl. Cal. and Nect. as in the barr. fl. Stam. none. Style 1. Berry superior, of 3 cells. Seeds in pairs.

Valeriana dioica. Some Salices.

Order III. TETRANDRIA. Stam. 4.

452. HIPPOPHÆE. *Barr. fl. Cal. deeply cloven. Cor. none.*

Fert. fl. Cal. tubular, cloven. *Style* 1. *Berry* superior. *Seed* solitary, oblong, with a double *tunic*.

453. MYRICA. *Barr. fl.* in a *catkin*. *Cal.* a concave scale. *Cor.* none.

Fert. fl. in a *catkin*. *Cal.* a concave scale. *Cor.* none. *Styles* 2. *Berry* superior, with 1 globular *seed*.

451. VISCUM. *Barr. fl.* *Cal.* none. *Pet.* 4, calyx-like, dilated and combined at the base. *Anth.* sessile on the petals.

Fert. fl. *Cal.* a slight border. *Pet.* 4, dilated at the base. *Style* none. *Berry* inferior, with 1 compressed *seed*.

Rhamnus 1. *Euonymus* 1. *Urtica* 3.

Order IV. PENTANDRIA. *Stam.* 5.

454. HUMULUS. *Barr. fl.* *Cal.* of 5 leaves. *Cor.* none. *Anth.* with 2 terminal pores.

Fert. fl. in a *catkin*. *Cal.* an oblique, undivided scale. *Cor.* none. *Styles* 2. *Seed* 1, tunicated, winged with the calyx.

Ribes 4. *Pimpinella* 3. *Bryonia* 1. *Salix* 5, 19.

Order V. HEXANDRIA. *Stam.* 6.

455. TAMUS. *Barr. fl.* *Cal.* none. *Cor.* in 6 deep segments.

Fert. fl. *Cal.* none. *Cor.* in 6 deep segments. *Style* 3-cleft. *Berry* inferior, of 3 cells. *Seeds* in pairs.

Rumex 9, 10.

Order VI. OCTANDRIA. *Stam.* 8.

457. RHODIOLA. *Barr. fl.* *Cal.* in 4 deep segments. *Pet.* 4. *Nect.* 4, notched.

Fert. fl. *Cal.* *Pet.* *Nect.* the same. *Pist.* 4. *Caps.* 4, with many *seeds*.

456. POPULUS. *Barr. fl.* *Catkin* imbricated. *Cal.* a torn scale. *Cor.* turbinate, oblique, undivided.

Fert. fl. *Catk.* *Cal.* *Cor.* the same. *Stigm.* 4 or 8. *Caps.* superior, of 1 cell and 2 valves. *Seeds* tufted.

Order VII. ENNEANDRIA. Stam. 9.

458. *MERCURIALIS. Barr. fl. Cal. in 3 deep segments. Cor. none. Stam. 9—12. Anth. of 2 globose cells.*

Fert. fl. Cal. the same. Cor. none. Styles 2. Caps. of 2 lobes and 2 cells. Seeds solitary.

459. *HYDROCHARIS. Barr. fl. Cal. 3-cleft. Pet. 3. Inner filam. beaked.*

Fert. fl. Cal. and Pet. the same. Styles 6. Caps. inferior, of 6 cells, with many seeds.

Empetrum 1.

(DECANDRIA. Stam. 10.)

Silene 9. Lychnis 4.

(ICOSANDRIA. Stam. numerous, from the calyx.)

Rubus 14. Fragaria 2.

(POLYANDRIA. Stam. numerous, from the recept.)

Stratiotes 1. Populus 1, 3, 4.

Order VIII. MONADELPHIA. Filam. combined in one set.

460. *JUNIPERUS. Barr. fl. Cal. scales of a catkin. Cor. none. Stam. 3.*

Fert. fl. Cal. scales of a catkin, fewer; finally pulpy, united into a berry, with 3 seeds.

461. *TAXUS. Barr. fl. Cal. none. Cor. none. Anth. pel-tate, lobed.*

Fert. fl. Cal. cup-shaped, entire. Cor. none. Style one. Seed 1, enclosed in the enlarged, pulpy, un-connected calyx.

Salix 25, 26.

DIOECIA DIANDRIA.

448. SALIX. Willow, Sallow, and Osier.

Linn. Gen. 514. *Juss.* 408. *Sm. in Rees's Cycl.* v. 31. *Fl. Br.* 1039.
Tourn. t. 364. *Lam. t.* 802. *Gærtn. t.* 90.

Nat. Ord. *Amentaceæ*. *Linn.* 50. *Juss.* 99.

Barr. fl. *Catkin* oblong, many-flowered, imbricated every way. *Cal.* a single-flowered, oblong, spreading, flexible *scale*. *Pct.* none. *Nect.* a small, lateral, oblong, abrupt, compressed, honey-bearing gland, sometimes double. *Filam.* 2, rarely 1, or from 3 to 5 or more, straight, thread-shaped, longer than the calyx; in some partly combined. *Anth.* 2-lobed, of 2 or 4 cells.

Fert. fl. *Catk.* and *Cal.* as in the *barr. fl.* *Pct.* none. *Nect.* as in the *barr. fl.* *Germ.* superior, ovate, sessile or stalked. *Style* terminal, various in length, extending a little beyond the calyx, permanent. *Stigm.* 2, notched and obtuse, or cloven and acute, spreading. *Caps.* ovate, obtuse, or tapering, of 1 cell, with 2 revolute, concave valves. *Seeds* numerous, minute, oval, tufted, with soft, simple, upright hairs.

Trees or *shrubs*, with round, flexible *branches*. *Leaves* simple, undivided, stalked, generally alternate, deciduous. *Stipulas* in pairs at the base of the *footstalks*, very variable in size, deciduous. *Catkins* early, erect or drooping, either from the same buds as the leaves, or more commonly from different ones. Their *florets* are almost universally separated, being all barren on one plant, and fertile on another of the same species, without the slightest possible difference, in the characters or appearance of the two individuals, in any other respect. Sometimes indeed a barren *floret* or two occurs in a fertile *catkin*, especially among the *monandrous* species; sometimes *catkins* have been found nearly equally fertile and barren, as in our *n.* 49, 50 and 51. In *n.* 52, *S. oleifolia*, Mr. Borrer has, for several years, traced the progress of this mutation in the organs of impregnation, which confirms a report, whose origin does not appear, of Willows changing the nature of their blossoms. This however is treated as a fiction by Linnæus, in his *Gen. Pl.* 514, without any assigned authority, and he proves mistaken.

If different circumstances may prevent, or promote, the production of *flowers* at all, see *Intr. to Botany*, ed. 5. 113, they may surely cause the above alteration; which though different, is not more surprising than peaches and nectarines, varying every year in comparative quantities, along with some individual fruits, half peach, half nectarine, which I have seen and tasted, from the same tree.

The arrangement of the species of Willows is a matter of considerable difficulty, as well as their technical discrimination. The smoothness or hairiness of their *leaves*, is in many cases variable, and when decided, or constant, often widely separates species naturally allied. The margin of those parts, whether entire, serrated, crenate, or toothed, cannot in all cases afford an indisputable character. The *stipulas* are variable in many respects. A suggestion in *Fl. Br.* 1072, recommending the *germen*, whether sessile or stalked, the length of the *style*, and the division of the *stigmas*, for discriminating natural sections of the genus, met with the approbation of some good botanists, and has been adopted by Wahlenberg, with the addition of the *germen* being downy or smooth; but the characters thus obtained, though excellent for the discrimination of species, do not lead to their natural arrangement. No good plan having yet been proposed, I have in Rees's *Cyclopædia*, and pretty nearly in the present work, followed that of Willdenow, which is liable to as few exceptions as any other. It is always advisable, in such undertakings, to be led by common usage, rather than doubtful speculation, and especially to avoid alteration, for the sake of alteration alone.

In the far more arduous undertaking of specific definition, the most able critics will be the most aware of my difficulties. Full 30 years have I laboured at this task, 10 of them under the instructive auspices of my late friend Mr. Crowe, in whose garden every Willow that could be got was cultivated; more especially all that could be obtained from any part of Britain, by that unrivalled collector Mr. Dickson. The plants were almost daily visited and watched by their possessor, whom no character or variation escaped; seedlings innumerable, springing up all over the ground, were never destroyed till their species were determined, and the immutability of each verified by our joint inspection. This was the more material, to set aside the gratuitous suppositions of the mix-

ture of species, or the production of new, or hybrid ones, of which, no more than of any change in established species, I have never met with an instance. Strange alterations in the shapes and sizes of *leaves*, and their *stipulas*, have indeed been seen, on young radical shoots, from a tree, or bush, that has been felled; but not more than usually happens in Poplars, Limes, Elms, and others.

Willows should be particularly studied at three different seasons; the flowering time, the early part of summer, when the young shoots, with their *stipulas* and expanding foliage, are to be observed; and finally when the *leaves* are come to their full size. No botanist therefore can be competent to form an opinion about them, unless he resides among the wild ones, for several seasons, or continually observes them in a garden. No hasty traveller over a country, no collector of dried specimens, or compiler of descriptions, can judge of their characters, or essential differences. One principle above all, in this department of Botany, and indeed in every other, cannot be too strictly enforced. We should study a species before we decide on its characters, and not lay down rules of definition beforehand. In many plants, the differences of simple or compound, entire, serrated or jagged *leaves*, the presence or absence of *stipulas*, though usually so essential and decisive, make no specific distinction at all. In some tribes, or genera, one part affords the best specific characters, in others some different part. The distinctions of Willows are frequently so very nice, that the greatest observation and experience only can stamp them with due authority. Yet persons to whom their qualities and uses are of the last importance, might hold a botanist very cheap, who could not help them to know one from another. I should have hoped that my excellent friend Dr. Hooker would have given Mr. Crowe and myself credit for some accuracy of observation, and not have set almost all our labours at nought, without some practical knowledge, at least, of his own. I am well convinced that he meant to be right, and should be truly sorry that his decisions, or his style of expressing them, should depreciate him in the opinion of persons who do not know him so well as I do. Satisfied with a careful revision of the subject, and with correcting myself wherever I could find occasion, I leave to others the ungrateful task of criticism. The errors of some, other-

wise able, authors are so extremely preposterous, as to want no refutation; nor could they be set right without an examination of their specimens, in order to know what they intended. There is reason to suspect, that even the acute Wahlenberg, one of the most justly esteemed botanists, has in many instances misunderstood the species of Linnæus, which indeed he had not sufficient materials to determine. The great difficulty, originally attending the Willows of Great Britain, consisted in ascertaining Mr. Lightfoot's species. This I accomplished by taking all the *Salices* of the Linnæan herbarium to Frogmore, where his collection was then preserved in the hands of her late Majesty Queen Charlotte. Thus, whatever mistakes might have been committed in the *Flora Scotica*, were corrected, and the nomenclature of the whole settled on the most indisputable grounds. In perusing the remarks of the great Dillenius, recorded by Linnæus, under almost every species of *Salix*, in the *Flora Laponica*, any botanist may perceive the erroneous ideas of that eminent man with regard to their synonyms; nor did Linnæus avoid great mistakes in his subsequent labours. If such men err, others ought to be the more guarded in their decisions. I submit what I have done, to the correction of those who have paid equal attention to the subject, and especially to the faithful and patient observers of Nature and lovers of Truth. They may, in the study of this important tribe of plants, render great service to Botany and to Agriculture.

* *Adult leaves serrated, smooth, or nearly so.*

1. *S. triandra*. Long-leaved Triandrous Willow.

Leaves linear-oblong, serrated, smooth; rather unequally sloping at the base. Stamens three. Germen stalked, ovate, compressed, smooth. Stigmas nearly sessile.

S. triandra. Linn. *Sp. Pl.* 1442. Willd. *v.* 4. 654. *Fl. Br.* 1044. *Tr. of Linn. Soc.* *v.* 6. 118. *Engl. Bot.* *v.* 20. *t.* 1435.

S. n. 9. Gmel. *Sib.* *v.* 1. 155. *t.* 34. *f.* 3. *From the author.*

S. n. 1637. Hall. *Hist.* *v.* 2. 305.

S. folio amygdalino utrinque aurito, corticem abjiciens. Raii *Syn. ed.* 2. 292. *ed.* 3. 448.

In wet woods, hedges, and osier-grounds, frequent.

Tree. *May and August.*

An upright tree, rising naturally, when not injured, to the height

of 30 feet ; towards autumn casting the *bark* of its trunk, and larger branches, in broad solid portions, cracking angularly asunder, like the Plane-tree. Young *branches* erect, long, tough and pliant, smooth, leafy, brownish, somewhat brittle at their joint or insertion. *Leaves* always perfectly smooth, numerous, scattered, stalked, 3 or 4 inches long, and an inch broad, linear-oblong, being contracted at each end only, for scarcely more than half an inch ; at the extremity into a taper point ; at the base into a somewhat unequal, rounded, but not ovate, shape ; their margin copiously beset with rounded, glandular teeth, or serratures ; the upper surface bright green ; under pale, or slightly glaucous ; their fine slender veins interbranching towards the edges. *Footstalks* about half an inch long, channelled ; minutely glandular at the summit ; dilated, but abrupt, at the base, without any swelling of the branch beneath their insertion. *Stipulas* ovate, or half-ovate, oblique, crenate, veiny, very variable in size, often short and abrupt ; often entirely wanting. *Catkins* solitary, at the ends of short, lateral, leafy branches, which in summer are axillary. *Scales* obovate, obtuse, of a tawny yellow, clothed externally with fine, long, spreading, more or less plentiful, hairs. *Nectary* single, with a blunt recurved point. *Filam.* 3, equal, twice the length of their scale. *Anth.* roundish, of 2 lobes. *Germ.* ovate-oblong, compressed parallel to the scale, perfectly smooth, rather abrupt. *Style* very short, with 2 spreading cloven *stigmas*. *Seeds* with a long, dense, snow-white, woolly crown.

The narrower-leaved Willows generally come under the denomination of Osiers, of which this is one of the most valuable. It is cultivated for white basket-work, producing rods 8 or 9 feet long, tough and pliant, even when stripped of their bark, and very durable. They are cut down every year.

Several varieties, if not distinct species, are comprehended under the name of *S. triandra*. Of these I venture to separate one as *S. Hoffmanniana*, which seems to be the *triandra* of German botanists in general. Another, called French Willow, cultivated in Sussex, as well as in the east parts of England, has *leaves* but half the size of our *triandra* above described, with more slender *footstalks*, and larger *stipulas*. This Mr. Crowe used to name *S. contorta*, esteeming it a doubtful species, not supposed to be wild in Britain. It is from 12 to 15 feet high, with *leaves* of a fine bright green, and large yellow *catkins*. *Stam.* 3, or more, thrice as long as the *scales*. I have not seen the fertile *flowers*, nor am I informed of the peculiar properties of this plant.

S. triandra of Villars is now distinguished by Flügge and Willdenow, n. 5, as *S. Villarsiana*, and is not known in Britain.

S. Hoppeana, Willd. n. 2, is characterized by having some *catkins* composed partly of barren, partly fertile, *florets*. Its *leaves*,

though very glaucous beneath, agree nearly with *S. triandra*, of which species Mr. Sieber, who sent me specimens from Saltzburgh, appears to think it a variety.

2. *S. Hoffmanniana*. Short-leaved Triandrous Willow.

Leaves ovate-oblong, serrated, smooth; slightly rounded at the base. Stamens three. Germen stalked, ovate, compressed, smooth. Stigmas nearly sessile.

S. triandra. *Hoffm. Sal. v. 1. 45. t. 9, 10. t. 23. f. 2. Curt. Lond. fasc. 6. t. 72. Ehrh. Arb. 19?*

On the banks of rivulets.

By the sides of streams in Sussex. *Mr. Borrer*. At Ditton near Cambridge. *Rev. J. Holme*.

Shrub. *May*.

Mr. Borrer, to whom I am obliged for first calling my attention to this Willow, as distinct from the Linnæan *S. triandra*, observes that the present is a shrub of more humble growth, being from 12 to 15 feet only in height. The leaves vary from $1\frac{1}{2}$ to $2\frac{1}{2}$ inches in length, and are in no respect linear, (their sides being no where parallel,) but either truly ovate, or ovate-lanceolate, with a very taper point; the under side light green, hardly glaucous. In the catkins of either sort no remarkable difference is to be found. Mr. Borrer has met with barren plants only; Mr. Holme noticed fertile ones also, but of the latter I have not seen more than the leaves, which are narrower, and more taper at the base, than the Sussex specimens, agreeing rather better with Ehrhart's and Curtis's; which two last may possibly hereafter prove distinct from our *Hoffmanniana*, as they, doubtless, are from the real *triandra*.

3. *S. lanceolata*. Sharp-leaved Triandrous Willow.

Leaves lanceolate, serrated, smooth; tapering towards each end. Footstalks decurrent. Germen stalked, ovate, smooth. Style as long as the stigmas.

S. lanceolata. *Engl. Bot. v. 20. t. 1436. Comp. ed. 4. 160. Hook. Scot. 278.*

S. undulata. *Ehrh. Beitr. v. 6. 101? Arb. 108?*

In low meadows, woods, and osier-grounds.

Near Lewes, in Sussex. *Mr. Woolgar*. In Angushshire. *Mr. G. Don*.

Tree. *April, May*.

Akin to the two preceding, casting its bark in the manner of *S. triandra*, but not attaining to so great a height. It is cultivated, and cut down annually, for the use of basket-makers, the rods

serving for brown hampers, crates, &c., but not for the finer sorts of baskets, as when peeled they are apt to split in working. An essential specific distinction exists in the *leaves*, which are longer and narrower than those of *triandra* or any of its reputed varieties, more pointed and tapering; not linear, but truly lanceolate. *Footstalks* bearing at the summit a pair of *glands*, or minute leaflets; not abrupt at the base, but decurrent, each meeting with a projection of the branch, tapering downward, and forming a kind of buttress, which character is clear and invariable. The *stipulas* are considerably pointed. In the *catkins* little difference is observable. Their *scales* vary from ovate to obovate, or almost linear, and are densely hairy or shaggy. *Germen* ovate, rather more tumid than in *triandra*, though occasionally a little constricted above the middle, always quite smooth, both in British specimens and the original ones of Ehrhart's *S. undulata*, as well as those of two other German botanists, though described in the *Beiträge*, and by Willdenow from the living plant, as downy. Could the copious hairs of the *scales* lead to this error? The *style* is evidently longer than that of *triandra*, and the *stigmas* also. There is nothing about our *lanceolata* to authorize the name *undulata*, nor indeed is any such character apparent in the German specimens. On the other hand, these have no glands upon the *footstalks*, and their youngest *leaves* are slightly downy, whereas our's are perfectly smooth in all states. Some uncertainty therefore attends the synonym of Ehrhart, and in any case I cannot but prefer an expressive to an unsuitable name.

I rely on the well-known accuracy of the late Mr. George Don for the synonym of Dr. Hooker. *S. lanceolata* of M. Seringue, *Saules de la Suisse* 37. t. 1, is very different from mine.

4. *S. amygdalina*. Broad-leaved Triandrous Willow; or Almond-leaved Willow.

Leaves ovate, serrated, smooth; rounded and unequal at the base. Stamens three. *Germen* ovate, compressed, smooth; its stalk almost as long as the scale. *Stigmas* nearly sessile. Young branches furrowed.

S. amygdalina. Linn. *Sp. Pl.* 1443. Willd. v. 4. 656. *Fl. Br.* 1045. *Tr. of L. Soc.* v. 6. 119. *Engl. Bot.* v. 27. t. 1636. *Lightf.* 596?

S. n. 1636. *Hall. Hist.* v. 2. 305.

S. folio auriculato splendente, flexilis. *Raii Cant.* 144. *Syn. ed.* 2. 291. *ed.* 3. 448.

S. spontanea fragilis, amygdalino folio. *Bauh. Hist.* v. 1. p. 2. 214. f. 215?

S. purpurea nigra viminalis. *Dalech. Hist.* 276. f. ?

On the banks of rivers and ditches.

On Badley Moor, near Dereham, Norfolk. *Mr. Crowe*. Near Cambridge. *Rev. J. Holme*. About Lewes, Sussex. *Mr. Woolgar*. In Osier-grounds, but not common in Norfolk or Suffolk, being esteemed a bad Osier.

Shrub, or small tree. *April, May*; and again in *August*.

This seldom, or never, becomes more than a small slender tree, even when left to its natural growth, and may rather in general be termed a large bushy shrub, casting its bark in autumn. If cut down every year, it produces rods 6 or 8 feet long, in considerable plenty, fit for coarse basket-work, but not equal to *S. triandra* when peeled. The branches are rather spreading, round, smooth, yellowish, strongly furrowed, and often purplish, when young. Leaves on thick and shortish stalks, most truly ovate, (though a little elongated and taper-pointed,) being rounded at the base, where their two halves are frequently oblique or unequal. The figure in *Engl. Bot.* is correct in this and all other respects; exhibiting amongst other things sufficient to convince an attentive botanist of the distinctness of the species, the outline of a very large leaf, from a young vigorous shoot. The leaves are of a rich shining green above; pale, opaque, and glaucous beneath; with fine, copious veins; the margin beset with small, blunt, often unequal teeth. Stipulas commonly larger than in several nearly allied species, on which character some botanists have much relied, but their size is variable. They are however broad, and strongly crenate, often unequally heart-shaped. Scales of both catkins obovate, yellowish, slightly hairy, seldom quite smooth. Stam. 3, sometimes more, equal, thrice the length of their scales. Germ. green, smooth; its stalk nearly equal to the scale. Caps. large, ovate, compressed, each valve tipped with one of the short, eloven, nearly sessile, permanent stigmas. Down of the seeds shorter, and less abundant, than in *S. triandra*.

As a British plant *S. amygdalina* was formerly involved in some uncertainty. Hudson perhaps took it up on the authority of the Linnæan dissertation entitled *Flora Anglica*, on which he relied for Ray's synonym cited above, and this led him to that of Haller, who received specimens from Dillenius. Thus far all is perfectly correct. What Lightfoot intended is less clear. His description is partly compiled from Haller, and his only authority for this Willow, as a native of Scotland, is Dr. Parsons, in whose time nobody was well acquainted with it. Linnæus hesitated to refer it to *S. triandra*; which he knew only from Gmelin's specimens, still remaining in his herbarium, and not as a Swedish plant. Neither had he examined the flowers of *amygdalina*, nor had Lightfoot ever seen them. Mr. Curtis seems to have been contemplating all these uncertainties, when he "strongly suspected *S. amygdalina* to be no other than *triandra*." Mr. Crowe indeed first accurately compared and

distinguished them, by their *leaves*, so that no doubt can arise in future. The learned inquirer will find the synonyms of *S. fragilis* obscurely implicated in the history of these species; yet nothing can be much less like them in habit, characters, or qualities. Haller's *S. persicæ folio auriculato*, p. 151 of his first edition, is marked *S. fragilis* in that book by Linnæus, himself, though quoted in *Fl. Suec. ed. 2.* 346, for *amygdalina*; and it appears by the description of Haller that he had the *fragilis* originally before him. In his second edition, under n. 1636, the description is altered, and rather accords with *amygdalina*.

5. *S. pentandra*. Sweet Bay-leaved Willow.

Leaves ovate, pointed, crenate, glandular, smooth. Footstalks glandular at the summit. Stamens five or more, hairy at the base. Germen ovate, tapering, smooth, nearly sessile.

S. pentandra. Linn. *Sp. Pl.* 1442. Willd. v. 4. 658. *Fl. Br.* 1046. *Tr. of L. Soc.* v. 6. 120. *Engl. Bot.* v. 26. t. 1805. Dicks. II. *Sicc. fasc.* 3. 15. Hook. *Scot.* 279. *Fl. Dan.* t. 943. Ehrh. *Pl. Off.* 309. *Arb.* 48.

S. n. 1639. Hall. *Hist.* v. 2. 306.

S. n. 7. Gmel. *Sib.* v. 1. 153. t. 34. f. 1. From the author.

S. folio laureo, sive lato glabro odorato. How *Phyt.* 108. Raii *Syn.* 449.

About rivers, chiefly in the north of England and south of Scotland.

At Wolverhampton. Dr. How, who first noticed this species. In Westmoreland, and the mountainous parts of Yorkshire, frequent. Ray. About Moffat, and in many other places.

Tree. June, July.

A handsome upright tree, about 15 or 20 feet high, exhaling a fragrant bay-like scent from the resinous notches of its leaves, as well as from the barren catkins. The branches are smooth and shining. Leaves on stout, rather short, footstalks, with very small stipulas, or none at all, ovate, with a taper point; their length 2 or 3 inches; breadth an inch, or inch and half; both sides finely veined, perfectly smooth; the upper of a full, rich, shining green; under paler, and more opaque; their edges finely and copiously crenate throughout, discharging a yellow resin, whence the scent originates. This resin, as Linnæus observes, stains paper between which the leaves are pressed, with rows of permanently yellow dots. About the top of each footstalk, in front, are several glands, likewise resinous. Catkins solitary, at the ends of leafy shoots of the present year, as in other species; the barren ones large, dense, yellow, with oblong, obtuse, hairy scales, half the length of their 5 or 6, sometimes 8 or 9, filaments, which are more or less densely

bearded at the base; the common stalk or *receptacle* is also hairy. Fertile *catkins* about the same size, often 2 inches long, their *receptacle*, and base of the *scales*, hairy. *Germens* smooth, ovate, elongated and contracted in their upper part, much longer than the scales, each on a very short stalk. *Style* thick, scarcely so long as the deeply-cloven *stigmas*.

For its beauty and fragrance this Willow deserves cultivation in gardens, but its use in other respects is inferior to many. The dyeing quality, mentioned in *Fl. Suec.*, rather belongs to the supposed variety, first distinguished as a species in Rees's *Cyclopædia*, by the name of *tinctoria*, and whose branches serve to bind down thatch in the south of Sweden, where that plant grows wild.

6. *S. nigricans*. Dark-broad-leaved Willow.

Leaves elliptic-lanceolate, acute, crenate; smooth, with a downy rib, above; glaucous beneath. Stamens two, thrice the length of the hairy scales. Germen lanceolate, downy, on a short downy stalk.

S. nigricans. *Sm. Tr. of L. Soc.* v. 6. 120. *Fl. Br.* 1047. *Engl. Bot.* v. 17. t. 1213. *Comp. ed.* 4. 161. *Willd. Sp. Pl.* v. 4. 659.

S. phylicifolia β . *Linn. Sp. Pl.* 1442. *Fl. Lapp.* n. 350. t. 8. f. c. *Herb. Linn.*

In fens, osier-grounds, woods and thickets.

At Wrongay fen, Norfolk. *Mr. Crowe*. Near Shobden Court, Herefordshire. *Mr. Dickson*.

Shrub. *April*.

A large bushy *shrub*, scarcely attaining the height or form of a tree, with upright, round, stout, rather brittle *branches*, smooth except when young. *Leaves* 2 or 3 inches long and 1 inch broad, elliptic-lanceolate, acute, or somewhat pointed; a little rounded, and sometimes unequal, at the base; unequally crenate almost throughout; the upper side dark-green, turning black in drying, quite smooth, even at an early period, except the mid-rib, which is generally finely downy; the under side glaucous, veiny, sometimes besprinkled with small scattered hairs, the mid-rib also being more or less hairy. *Footstalks* half an inch long, stout; downy above; greatly dilated at their base. *Stipulas*, if present, rather large, about half the length of the footstalks, obliquely heart-shaped, crenate, veiny, smooth. *Catkins* much earlier than the foliage, solitary at the ends of short lateral shoots, beset with a few small leaves. The barren ones an inch or inch and half long, rather thick; their *scales* obovate, hairy, brown in their upper half, white in the lower. *Filam.* 2, nearly thrice the length of the scales, hairy at the base, slender, swelling upward. *Anth.* of 2 oval lobes, yellow, subsequently brown. Fertile *catkins* (on the Lapland specimens)

2 inches long when fully grown. *Germen* awl-shaped, downy, on a short, thick, likewise downy, stalk. *Style* smooth, longer than the *stigmas*, permanent like them. *Caps.* ovate-lanceolate, silky, of 2 recurved, light-brown valves. *Seed* obovate, polished, with a copious woolly crown.

The young *buds* are tipped with a small tuft of deciduous down, as remarked by Linnæus, who in his *Fl. Lapp.* justly distinguished this Willow from his *phylicifolia*. It ought rather perhaps to be placed near *S. Forsteriana*, n. 57, and its allies, the *leaves* being seldom perfectly smooth on both sides. The supposed fertile plant, indicated in the Linnæan Transactions, is, at best, very doubtful, and I have not adverted to it in the above description. *S. nigricans* is of no known economical use. Whatever Wahlenberg may intend under this name, t. 1053 of *Fl. Dan.*, cannot be our plant, for which *Engl. Bot.* is the original authority.

7. *S. phylicifolia*. Tea-leaved Willow.

Leaves elliptic-lanceolate, with wavy serratures, very smooth; glaucous beneath. *Stipulas* glandular on the inside. *Germen* lanceolate, stalked, silky. *Style* twice the length of the *stigmas*. Branches trailing.

S. phylicifolia. Linn. *Sp. Pl.* 1442, α *Fl. Lapp.* n. 351. t. 8. f. d. Willd. v. 4. 659. *Fl. Br.* 1049. *Engl. Bot.* v. 28. t. 1958. *Tr. of L. Soc.* v. 6. 123. Wahlenb. *Lapp.* 270. t. 17. f. 2?

S. radicans. *Fl. Br.* 1053. Willd. v. 4. 676. Hook. *Scot.* 280.

In the Highlands of Scotland.

At Finlarig, Breadalbane. Rev. Dr. Stuart, in *Lightfoot's Herbarium*.

Shrub. May.

A low, spreading, smooth *bush*, whose long, recumbent, brown or purplish, *branches* take root as they extend in every direction. *Leaves* on shortish stalks, not much spreading, about 2 inches long, not 1 broad; very acute at the point; not at all rounded at the base; smooth at all times, except an obscure downiness on the mid-rib above; harsh to the touch, bitter, variously crenate or serrated, the serratures peculiarly, and sometimes very remarkably, undulated; the upper side of a dark shining green; under glaucous. *Stipulas* half-ovate, inclining to lunate, small, glandular at the inside towards the base. *Catkins* from small lateral branches, accompanied by 2 or 3 small *bracteas* rather than leaves, terminal, solitary; the fertile ones, which alone I have seen, all over hoary, with fine dense silky hairs. *Scales* linear-oblong, obtuse. *Nectary* single, abrupt. *Germen* lanceolate, or almost awl-shaped, on a stalk about a third its own length, and half as long as the scale. *Style* smooth, except at the base, about as long as the notched, spreading,

oblong *stigmas*, and subsequently longer. Barren *catkins* not observed.

Wahlenberg declares that the figure in *Engl. Bot.* agrees sufficiently well with his *S. phylicifolia*, but that in this latter the *germens* are much more elongated, (which his plate expresses,) and by no means silky; though the young *branches* are always downy, like the *footstalks*, and *common stalk* of each *catkin*. The last character only answers to our Scottish plant, whose young *branches* and *footstalks* are very smooth, while the *germens*, *scales* and *common stalk* are silky. This author therefore must mean a distinct species from our's. The specimens of Lightfoot and Linnæus precisely agree in *leaves*, but both are destitute of fructification; so that the points in dispute, cannot by them be absolutely settled, except that their *branches* and *footstalks* are smooth.

Fl. Dan. t. 1052 bears scarcely any resemblance to the species before us; and *t.* 1053 is quite different from *S. nigricans*. *S. Croweana* is as unlike *phylicifolia*.

8. *S. Borreriana*. Dark Upright Willow.

Leaves lanceolate, with shallow even serratures, very smooth; glaucous beneath. *Stipulas* obsolete. *Branches* upright. *Scales* of the *catkins* acute, shaggy.

S. Linn. Fl. Lapp. n. 350? *Fl. Dan. t.* 1052?

In the Highlands of Scotland.

In Breadalbane and Glen Nevis. *Mr. W. Borrer*.

Shrub. *May*.

A bushy *shrub*, 8 or 10 feet high, with copious, dark-brown or blackish, short *branches*, quite smooth in every stage of growth, and always erect, by no means spreading or trailing. *Leaves* perfectly lanceolate, with smaller, more even serratures than the last, dark-green, quite smooth at every period, and about 2 inches long; their under surface very glaucous, or blueish. *Footstalks* longer, and more slender, than the foregoing. *Stipulas* scarcely ever visible, but, if present, very small and lanceolate. Barren *catkins*, the only ones I have seen, copious, lateral, on short stalks, coming before the leaves; their *scales* ovate, acute, brown, densely shaggy with long silvery hairs, quite unlike the silky down of *S. phylicifolia*. *Filam.* 2, bright yellow, smooth, long and slender. *Anth.* oblong, of a deeper hue.

Fl. Dan. t. 1052, which has no *stipulas*, and which the author refers, with doubt, to *n.* 350 of *Linn. Fl. Lapp. t.* 8. *f. c.*, (that is *S. nigricans*,) comes nearer to *phylicifolia*; but answers better, except the broad-leaved shoot in the plate, to *S. Borreriana*, whose upright, bushy branches it well expresses. The *catkins* indeed are drawn much smaller, and their *scales* far less shaggy,

than in this species, which is certainly very distinct from any other Willow of British growth.

9. *S. nitens*. Shining-leaved Willow.

Leaves elliptical, acute, unequally serrated; very smooth and glaucous beneath; minutely downy, with a downy mid-rib, above. Stipulas obsolete. Branches spreading. Catkins nearly sessile, with acute, shaggy scales.

S. nitens. *Anders. Ms.*

In the mountainous parts of Scotland.

Brought from Scotland by the late Mr. George Anderson. *Mr. W. Borrer.*

Shrub. *April.*

A bushy *shrub*, 10 or 12 feet high, with long, spreading, or ascending, leafy *branches*, whose bark is dark-brown or purplish, smooth, except a slight downiness on the very youngest shoots. *Leaves* $1\frac{1}{2}$ inch long, and nearly half as broad, elliptical, acute, slightly rounded at the base; unequally serrated, partly crenate, and partly undulated; their upper surface of a deep shining green, partially and minutely downy, with a reddish, densely downy, mid-rib; under glaucous, with many transverse parallel veins, and quite smooth throughout, except when very young. *Footstalks* stout and rather short, dark brown; downy above; much dilated at the base. *Stipulas* if present half ovate, soon withering; often entirely wanting. *Barren catkins* earlier than the leaves, lateral, an inch long, on very short stalks, accompanied by a few small, oblong, entire, externally silky, *floral leaves*. *Scales* brown, ovate, shaggy with long white hairs; the upper ones bluntish. *Filam.* yellow, smooth, except sometimes at the bottom, thrice as long as the scales. *Fertile catkins* not yet observed.

I cannot refer this to any described species, and probably the *germens* and *styles*, if known, might afford additional distinctions. It comes nearest to the two last, especially to *S. phylicifolia*, and is also allied to *S. tenuifolia*.

10. *S. Davalliana*. Davallian Willow.

Leaves obovate-lanceolate, finely serrated, or minutely toothed, tapering at each end, smooth; rather glaucous beneath. Footstalks, mid-rib, and young branches, somewhat downy. Catkins with small rounded scales. Capsules lanceolate, smooth.

S. phylicifolia. *Willd. Sp. Pl. v. 4. 659; omitting the synonyms.*

In the Highlands of Scotland.

Brought from Scotland, and cultivated, like the preceding, by the late Mr. G. Anderson. *Mr. W. Borrer*.

Shrub. *May*.

About 6 feet high, bushy, with upright, smooth, brown *branches*. *Leaves* about an inch and half long, broadest above the middle, sharp-pointed, bordered with shallow serratures, or minute glandular teeth; tapering at the base; smooth, except a slight downiness on the mid-rib of the youngest; their veins reticulated at right angles. *Stipulas* scarcely ever discernible. *Foot-stalks* slender, downy on their upper side; slightly dilated at the base. Fertile *catkins* rather earlier than the leaves, on short, lateral, leafless stalks; the *main stalk* of each, as well as the small, rounded, though variable, *scales*, the stalks of the germen, and the *germens* themselves, all more or less silky, not hairy, the latter in a Swiss specimen nearly smooth. They are always lanceolate, moderately stalked, each with a smooth *style*, full as long as the blunt, deeply divided, *stigmas*. *Capsules* lanceolate, smooth, or somewhat silky. *Seeds* few, with long, not very copious, down. The barren plant I have not seen.

My late friend Mr. Davall sent a specimen of this *Salix* from Switzerland in 1790, which, when shown to Prof. Mertens, was pronounced by the latter to be *S. phylicifolia* of Willdenow and other German botanists. It is not however that of Linnæus, nor apparently of Wahlenberg. A plant brought from Scotland, and seen by the same able botanist in Mr. Borrer's garden, received from him the same appellation. This agrees with the original Swiss specimen, except that the *germens*, and indeed all parts of the *catkins*, are much more silky; a character which often proves variable. Possibly *Fl. Dan. t. 1052* may represent this Willow, but it is not sufficiently like, in the outline of the *leaves*, to be taken for it. At any rate, this species deserves to be recorded, as admitted, on all hands, to be distinct, by the meritorious name of its earliest discoverer. *S. appendiculata* of Villars, *t. 50. f. 19*, is evidently very different, though cited by Willdenow.

11. *S. Wulfeniana*. Wulfenian Willow.

Leaves obovate or elliptical, somewhat pointed, finely serrated, smooth; glaucous beneath. Catkins dense, with hairy scales, longer than the stalks of the awl-shaped germen. Style longer than the stigmas.

S. Wulfeniana. Willd. *Sp. Pl. v. 4. 660*. Sm. in Rees's *Cycl. n. 16*.

S. phylicifolia. Host. *Syn. 526*. Wulf. in Jacq. *Coll. v. 2. 139*; exclusive of the references to Linnæus.

In valleys among the Highlands of Scotland, and in Westmoreland.

In Breadalbane; also by the river side near the bridge at Kirby Lonsdale. *Mr. W. Borrer.*

Shrub. *April, May.*

Stem branched, at first diffuse, 12 or 18 inches high; afterwards upright, attaining the height of a man; *branches* straggling, short, scarcely downy, except partially when young. *Leaves* an inch or inch and half long, broadly obovate at an early period, afterwards more elliptical, with a small point; smooth all over, except at an early age, when the upper surface and its midrib, as well as the *footstalks* above, are now and then finely downy; the under side is glaucous and always smooth, like the back of the footstalks; veins reticulated at right angles, as in the last; serratures shallow. *Stipulas* very minute in our specimens, and scarcely discernible in Wulfen's, communicated by Jacquin; but they are said to appear on the oldest branches, of an ovate, acute shape, or clasping the branch in a semicircular form. *Catkins* accompanying the young leaves, each on a short, lateral, downy, almost leafless, stalk; the barren ones an inch long; fertile when in fruit twice as large. *Scales* oblong, more or less hairy, always fringed. *Stamens* thrice their length, as is likewise the awl-shaped, mostly smooth, *germen*, whose densely hairy stalk is only about half as long as the annexed scale. *Caps.* smooth, tumid at the base, awl-shaped above. *Style* and *stigmas* permanent, smooth; the latter deeply cloven, about half the length of the style.

12. *S. tetrapla*. Four-ranked Willow.

Leaves elliptic-oblong, pointed, unequally serrated, nearly smooth; glaucous, with prominent veins, beneath. *Stipulas* half-heartshaped. Scales mostly shorter than the hairy stalks of the ovate-oblong smooth germens. Style as long as the stigmas.

S. tetrapla. *Walk. Ess.* 408; according to Mr. G. Anderson.

In the Highlands of Scotland.

Gathered in Breadalbane, by *Mr. W. Borrer.*

Shrub. *May.*

Nearly related to the last, from which I will not assert it to be specifically distinct. Yet having long been known by the name of *tetrapla*, which originated with the late Rev. Dr. Walker, I think it worth noting, for future examination. This name alludes to the spiral insertion of the *leaves*, of which, according to the learned writer, four complete each circuit of the branch. The whole *shrub* is larger than *S. Wulfeniana*; the *leaves* longer, more elliptical, and more pointed, with unequal, coarse and wavy serratures; deep green above; finely glaucous, with prominent, pale or reddish, veins beneath; smooth, except a very

minute, short, dense downiness on the upper side of the midrib and of the *footstalk*. Sometimes even this slight pubescence is wanting. *Catkins* from several short, leafless, lateral, crowded stalks. *Scales* often in pairs, bearded; those in the lower part of the catkin oblong, about equal to the stalks of the *germens*; the rest rounded, and much shorter. *Germen* ovate and tumid at the base, thrice the length of its downy stalk, tapering towards the extremity, where it is, now and then, a little silky, but otherwise quite smooth. *Style* smooth, as long as the deeply cloven *stigmas*. I am not certain of the barren plant of this species. Those who may fortunately ascertain it, will perhaps find characters, either to confirm those proposed above, or to set aside the species, for there are traces of variableness about all the specimens I have seen.

13. *S. bicolor*. Shining dark-green Willow.

Leaves elliptic-oblong, acute, waved and slightly serrated, nearly smooth; glaucous beneath. Footstalks dilated at the base. Stipulas pointed, serrated. Scales obtuse, hairy, half as long as the densely downy, ovate, long-stalked germen.

S. bicolor. *Ehrh. Arb.* 118. *Fl. Br.* 1048. *Engl. Bot.* v. 26. t. 1806.

Rees's Cycl. n. 19. *Winch Guide*, v. 1. 89. *Willd. Sp. Pl.* v. 4. 691.

S. laurina. *Tr. of L. Soc.* v. 6. 122. *Willd.* v. 4. 662.

In woods and thickets, in various parts of Britain; not uncommon in Norfolk.

Shrub, or small tree. *April, May*.

Branches at first erect and wand-like, round, of a mahogany colour, beset with copious, nearly upright leaves, and attaining the height of 6 feet. If neglected, the plant becomes a small tree. The youngest shoots only are downy or minutely hairy. *Leaves* 2 or 3 inches long, and an inch, more or less, in breadth, shorter, but not narrower, in Ehrhart's specimen than most English ones; all terminating in a short, broadish point; the margin unequally toothed, here and there slightly revolute, rarely a little wavy; the base rather sloping, slightly, and not uniformly, rounded; the upper side of a full, bright, shining green, not so much blackened by drying as in *S. nigricans* or some others, and for the most part smooth, except the midrib, the very youngest only being all over downy. The under side is very glaucous, slightly hairy in a young state only, with numerous, prominent, interbranching veins. *Footstalks* downy on the upper side, broad and triangular at the base; their length various on the same tree. *Stipulas* half-heartshaped, acute, serrated, usually small, but variable. *Catkins* earlier than the foliage, lateral, solitary, on short stalks, with a few ovate, very

silky, *floral leaves*; their *scales* oblong, obtuse, except the lower ones, brown at the upper part, and bearded with long hairs. *Germen* ovate-lanceolate, on a *stalk* half its own length, both together twice the length of the scale, and both densely clothed with snow-white, cottony down.

This species is unfit for any economical use. The twigs are brittle, and though the leaves are large and handsome, the bush itself is not ornamental. It is in some points allied to the *Salix* low tribe.

14. *S. tenuifolia*. Thin-leaved Willow.

Leaves elliptical, acute, serrated, smoothish; glaucous beneath. *Stipulas* small or none. *Scales* hairy. *Capsule* ovate, smooth, on a short smooth stalk.

S. tenuifolia. *Sm. in Linn. Fl. Lapp. ed. 2. 292. n. 352. t. 8. f. e. Fl. Br. 1052. Engl. Bot. v. 31. t. 2186. Rees's Cycl. n. 20. Willd. Sp. Pl. v. 4. 662.*

S. n. 1647. Hall. Hist. v. 2. 308.

About the rocky banks of rivers.

Above the bridge at Kirby Lonsdale, Westmoreland. 1783. Sent from Scotland to the late Mr. T. F. Forster, from whose cultivated plant the figure in *Engl. Bot.* was taken.

Shrub. *May, June.*

A copiously branched spreading *shrub*, from 1 to 2 feet high; 3 or 4 times as much if allowed to grow undisturbed in a garden; the *branches* round, very smooth after the first season, but clothed, while young and leafy, with fine, short, dense, curved pubescence. *Leaves* broadly elliptical, the lowest somewhat obovate; pointed, contracted, or acute, at each end; the margin partly serrated and wavy, especially about the middle; partly entire, or often crenate; the upper surface bright green; under glaucous, or whitish, with prominent rectangular veins; both sides variously besprinkled with fine, minute, close hairs, sometimes scarcely visible. *Footstalks* short, densely downy all over, as is the *midrib* occasionally. *Stipulas* very small in the wild plant, often wanting, quite smooth, serrated, either lanceolate and straight, or half-ovate, sometimes curved. *Catkins* solitary, on short, lateral branches, with 2 or 3 pretty large *floral leaves*; the barren ones yellow, cylindrical, slender, an inch long, with linear, long-bearded *scales*; *stamens* 2, a little hairy occasionally; fertile ones longer and thicker, at least when the seeds ripen. *Capsules* ovate, not quite sessile, as they seem at first sight, but each on a short, perfectly smooth *stalk*, their surface not at all downy, but somewhat wrinkled or uneven. *Style* longer than the 2 thick notched *stigmas*.—The substance of the *leaves*, at least while rather young, is thin and pliant; their length varies from $1\frac{1}{2}$ to 2 inches. I cannot sepa-

rate from this the more downy variety, mentioned in *Fl. Brit.* whose *stipulas* also are quite smooth ; nor can I refer either of them to any of the foregoing, more rigid-leaved, species. There is, unquestionably, a great affinity between the present and 3 of the preceding ones, *nitens*, *Wulfeniana*, and *tetrapla* ; of which not having studied living specimens, nor growing plants, I do not venture to say anything decisive. I must recommend them to the patient observation of good botanists and cultivators.

Willdenow very justly remarks that his *S. coruscans*, n. 53, *Arbuscula* of Jacq. *Austr. t.* 408, is nearly akin to *tenuifolia*.

15. *S. malifolia*. Apple-leaved Willow.

Leaves elliptic-oblong, toothed, waved, thin and crackling, very smooth. *Stipulas* heart-shaped, about equal to the footstalks. Scales obovate, bearded. Germen lanceolate, smooth, on a short smooth stalk.

S. malifolia. *Fl. Br.* 1053. *Engl. Bot. v.* 23. *t.* 1617. *Rees's Cycl. n.* 23. *Willd. Sp. Pl. v.* 4. 676.

In thickets.

Mr. Crowe was always persuaded that he found this Willow wild in some part of Norfolk, from whence he took cuttings for his garden. It has since been gathered in Scotland, and was perhaps originally sent from thence by Mr. Dickson, who supplied Mr. Crowe with several new Scottish species.

Shrub. *April*.

The aspect of this *Salix* is altogether singular amongst our British kinds, resembling some sort of Apple-tree rather than a Willow. The *stem* is from 3 or 4 to 6 feet high, crooked, with numerous, irregular, spreading, crooked or wavy *branches*, most leafy about the ends ; their bark blackish ; the young ones hairy. *Leaves* crowded, irregularly spreading, somewhat twisted, full 2 inches long and 1 broad, of a thin dry and crackling texture, like an evergreen, though perfectly deciduous ; their shape elliptic-oblong, with short or blunt points, sometimes obovate and narrower ; contracted, not rounded nor heart-shaped at the base ; the margin unequally wavy and copiously toothed ; both surfaces quite smooth ; the upper bright green ; under glaucous, with prominent, parallel, pale veins, interbranching near the edges ; midrib reddish, always perfectly smooth. *Footstalks* smooth, short and thick, broad at the base, rarely a little hairy at the back. *Stipulas* as long as the footstalks, or a little longer, recurved, irregularly heart-shaped, toothed, smooth ; glaucous beneath. Fertile *catkins*, the only ones I have seen, earlier than the foliage, an inch long, erect, dense, hoary, on short lateral stalks, bearing also a few lanceolate, acute, pale-green, erenate floral leaves. *Scales* obovate, copiously bearded,

half the length of the lanceolate smooth *germen* and its smooth shortish stalk. *Style* about the length of that stalk, with blunt undivided *stigmas*.

The only matter of doubt regarding this *Salix* is whether it be more than a variety of the Lapland *S. hastata*. After cultivating them together for many years, I have always thought them distinct. The *hastata* is more arborescent, with larger, more heart-shaped, *leaves*, and very large *stipulas*, often above an inch long, which give the leaves a hastate appearance. The fertile *catkins* are likewise larger, and more woolly; their *scales* not so properly bearded, as clothed with copious dense wool. In the *germens*, *styles*, &c., I find no difference. Dr. Wahlenberg unites these two species, commending the plate in *Engl. Bot.* as a good figure of his *hastata*, which, as he says, varies, "beyond measure or belief," in the shape and dimensions of its *leaves*. Thus far I might submit to his better opportunities of studying the *hastata*, and all its possible varieties, wild, in Lapland. But when the same learned writer reduces to this species *S. Arbuscula*, *Linn. Lapp. n.* 360. *t.* 8. *f.* m, I cannot help suspecting a great mistake, few plants being more distinct; nor is *S. tenuifolia* of Afzelius, which we examined and named together, more than distantly allied to either. Wahlenberg's figure, *t.* 16. *f.* 5, does not answer to any of them, and cannot be meant for any state of *hastata* or *malifolia*. I have indeed *S. hastata* from Switzerland, Haller's *n.* 1654, named *S. Arbuscula* long before Wahlenberg's *Fl. Lapp.* appeared. A similar specimen could hardly have misled him. It is difficult to conjecture what *S. hastata* of M. Seringe, *Saules de la Suisse*, 58, can possibly be, so inconsistent is the assemblage of synonyms, and so discordant is the description with our true Linnæan *hastata*. This author never saw the *leaves*, without which nothing can be determined; but if once seen, they can never be mistaken. Three species more dissimilar than my *malifolia*, *tenuifolia*, and the Linnæan *Arbuscula*, hereafter described, *n.* 33, cannot possibly be brought together.

16. *S. petiolaris*. Dark-long-leaved Willow.

Leaves lanceolate, serrated, smooth; glaucous beneath; somewhat unequal at the base. *Stipulas* lunate, toothed. *Catkins* lax. *Scales* hairy, shorter than the stalks of the ovate silky *germens*. *Stigmas* divided, sessile.

S. petiolaris. *Sm. Tr. of L. Soc. v.* 6. 122. *Fl. Br.* 1048. *Engl. Bot. v.* 16. *t.* 1147. *Rees's Cycl. n.* 28. *Willd. Sp. Pl. v.* 4. 665. *Hook. Scot.* 280. *Pursh* 616.

In osier-grounds and swamps.

Sent from Scotland, by the late *Mr. Dickson*. In Possil marsh,

on the north side of the canal ; Mr. David Don. Marshes in Angussshire ; Mr. George Don. *Hooker*.

Shrub, or small tree. *April*.

A bushy *tree*, with slender, spreading, flexible, smooth, purplish, or dark brown, *branches*. *Leaves* about 4 inches long, and nearly 1 broad, pointed, serrated, smooth on both sides ; bright green above ; glaucous beneath ; soon turning black as they dry ; their base unequal and obtuse. *Footstalks* long, linear, and slender ; downy above, like the midrib. *Stipulas* lanceolate, serrated, smooth, somewhat curved, or lunate ; often wanting. The young *leaves* are revolute, partly silky, very thin and tender. Fertile *catkins* before the leaves, solitary, on short lateral bracteated stalks, as usual ; an inch long, soon becoming longer, and rather lax. *Scales* rounded, notched ; the upper ones most oblong ; all hairy, or almost bristly. *Stalk* of the germen as long as the adjoining scale, or longer, hairy. *Germen* ovate, obtuse, clothed with silky hairs. *Stigmas* nearly or quite sessile, thick, deeply cloven. I know nothing of the barren plant.

After gathering, the young *leaves* especially exhale a strong scent, like the flavour of bitter almonds, but less agreeable. No use has been made of this Willow, though it seems to abound in the substance called *Tannin*. Mr. Pursh has suspected it not to be truly British ; but there seems no reason why, like several other Willows, it may not grow wild in Europe as well as in North America, and the authorities above mentioned are not likely to be erroneous. Nobody, who has seen the living plant, can confound it with any other, either British or exotic.

17. *S. vitellina*. Yellow Willow, or Golden Osier.

Leaves lanceolate, acute, with cartilaginous serratures ; smooth above ; glaucous and somewhat silky beneath. *Stipulas* minute, lanceolate, deciduous, smooth. *Germen* sessile, ovate-lanceolate, smooth. *Scales* linear-lanceolate, acute, fringed at the base, longer than the pistil.

S. vitellina. *Linn. Sp. Pl.* 1442. *Willd. v.* 4. 668. *Fl. Br.* 1050. *Engl. Bot. v.* 20. *t.* 1389. *Purt.* 470. *Hook. Scot.* 281. *Winch Guide. v.* 1. 89. *Hopkirk Glott.* 118. *Hoffm. Sal. v.* 1. 57. *t.* 11, 12. *t.* 24. *f.* 1. *Ehrh. Arb.* 78.

S. n. 1635 β . *Hall. Hist. v.* 2. 304.

S. sativa lutea, folio crenato. Bauh. Pin. 473.

S. folio longo subluteo, non auriculata, viminibus luteis ; eademque viminibus rubris. Raii Syn. 450.

S. folio utrinque glauco, viminibus rubris. Raii Cant. 142.

S. lutea tenuior sativa viminea. Bauh. Hist. v. 1. *p.* 2. 214. *f.* ; bad,

the leaves being represented opposite, and strongly fringed, or toothed.

In osier-grounds and swamps.

In rough low pastures at Ovington, near Watton, Norfolk, abundantly, and truly wild. *Mr. Crowe*. On the banks of the Team, Durham. *Winch*. On the banks of the Clyde, frequent. *Hopkirk*.

Tree. *May*.

A handsome *tree*, of a moderate height, with plenty of nearly upright, smooth and shining, yellow *branches*, still more ornamental when they become drooping; at all times rendering the plant conspicuous, and distinguishable from every other Willow. *Leaves* 2 or 3 inches long, lanceolate, tapering at each end, narrow, with numerous fine cartilaginous serratures; the upper side green and smooth; under glaucous, more or less besprinkled with silky hairs; both sides, in a young state, are silky, with a silvery gloss. *Footstalks* rather short and thick, smooth, like the branches, except when young. *Stipulas* rarely seen; when present very small, lanceolate, serrated, their upper or inner surface smooth; and they mostly fall before the leaves. *Catkins* early, tapering, yellow, on short lateral branches, with a few broadish-lanceolate floral leaves, silky beneath; the barren ones 2 inches, fertile 1 inch, long. *Scales* of both lanceolate, wrinkled, or wavy, more or less woolly. *Stam.* 2, rarely 3; when full-grown longer than their scale. *Germ.* shorter than its scale, nearly or quite sessile, ovate, obtuse, smooth. *Style* deeply cloven, with blunt notched *stigmas*. The *nectary* consists of 1, 2, or 3 obtuse, yellow, notched scales, but it is liable to several variations.

The smoothness of the full-grown *leaves*, at least of their upper side, has occasioned this species to be placed in the present section, and not next to the *S. alba*, to which in other characters, as well as general habit, it is so very near, that Haller took it for a mere variety. Hoffmann observes that the *liber*, or inner layer of the bark, is yellow, while that of the *alba* is green; but I have great doubts of the constancy of this character.

S. vitellina is cultivated for ornament, as well as for use as an osier, the rods being tough and flexible, fit for many purposes of basket-work, as well as for package. It has been introduced from Europe into North America, where, according to Mr. Pursh, it is common by road sides, and in plantations.

18. *S. decipiens*. White Welsh, or Varnished Willow.

Leaves lanceolate, pointed, serrated, very smooth; floral ones partly obovate and recurved. Footstalks somewhat glandular. Germen tapering, stalked, smooth. Style

longer than the cloven stigmas. Branches smooth, highly polished.

S. decipiens. *Hoffm. Sal. v. 2. 9. t. 31. Fl. Germ. v. 1. 343. Engl. Bot. v. 27. t. 1937. Comp. ed. 4. 161. Rees's Cycl. n. 37. Winch Guide, v. 1. 90. Forst. Tonbr. 112. Pursh. v. 3. 76.*

In low meadows, moist hedges, or osier-grounds.

About Tonbridge, not uncommon. *Forster.* In Northumberland and Durham. *Winch.* In many moist hedges around Lewes, Sussex. *Mr. Woolgar.* Cultivated in several osier-grounds of Norfolk and Cambridgeshire. *Mr. Crowe.*

Tree. *May.*

An upright but not lofty tree, distinguished by the smooth, clay-coloured bark of the last year's branches, which shines like porcelain, as if varnished; the shoots of the present year being stained with a fine red, or crimson. *Leaves* lanceolate, 3 or $3\frac{1}{2}$ inches long, tapering at each end, serrated throughout, with copious, bluntish, somewhat incurved, tooth-like serratures; smooth on both sides, except the youngest, which are silky, especially their midrib. *Footstalks* downy along their upper side; glandular, or bearing two small leaves, at the summit. *Stipulas* half-ovate, acute, toothed, for the most part small, often wanting. *Catkins* on small leafy branches, with from 3 to 5, spreading or recurved, obovate, nearly entire, *floral leaves*; the barren ones cylindrical, dense, 2 inches long; fertile rather longer. *Scales* of both elliptic-oblong, obtuse, fringed and downy rather than hairy, or bearded. *Stam.* 2, very rarely 3, with a *nectary* of 2 opposite unequal glands at their base. *Germen* lanceolate, smooth, on a shortish smooth stalk, and tapering into a stout smooth style, one third its own length. *Stigmas* obtuse, cloven, half as long as the style.

Hoffmann first distinguished and delineated this species. Many botanists have confounded it with *S. fragilis*, to which it is referred in the *Flora Britannica*; but on seeing them together growing, they were readily distinguished. The present is truly wild in several parts of England, and is not unfrequently cultivated, producing, for a few years, good rods for basket-work, but they gradually become shorter, and not worth cultivating. The tree is not inelegant, and may be admitted into ornamental plantations, in low situations, along with the Golden Osier.

19. *S. fragilis.* Crack Willow.

Leaves ovate-lanceolate, pointed, serrated throughout, very smooth. *Footstalks* glandular. *Germen* ovate, abrupt, nearly sessile, smooth. *Scales* oblong, about equal to the stamens and pistils. *Stigmas* cloven, longer than the style.

- S. fragilis*. Linn. *Sp. Pl.* 1443. *Fl. Lapp.* n. 349. t. 8. f. b. Willd. v. 4. 669. *Fl. Br.* 1051. *Engl. Bot.* v. 26. t. 1807. Hook. *Scot.* 279. Dicks. *H. Siee. fasc.* 16. 5. Ehrh. *Pl. Off.* 319. *Arb.* 88. *S. n.* 1638. Hall. *Hist.* v. 2. 305 ?
S. folio longo latoque splendente, fragilis. Raii *Cant.* 143. *Syn.* 448.

In low marshy grounds, about the banks of rivers.

Tree. *April, May.*

A tall, bushy-headed tree, whose branches are set on obliquely, somewhat crossing each other, not continued in a straight line, by which it may readily be distinguished in winter. They are round, very smooth, with a brown, polished bark, and so brittle at the base in spring, that with the slightest blow they start from the trunk. Such indeed is more or less the case with *S. deeipiens*, and several other Willows, both native and exotic; and having been observed in the preceding as well as following species, these have both been referred to *S. fragilis*, however distinct in characters and important qualities. Leaves 4 or 5 inches long, taper-pointed, lanceolate, with blunt, often unequal, but not coarse, serratures, very smooth, except in the earliest state, when they are rather silky; the upper surface is of a dark shining green; under paler; they are broadest toward the base, and when full-grown become rounded at that part, approaching to an ovate shape, as expressed in *Fl. Lapp.* t. 8. f. b, and agreeing with the original Linnæan specimen, though the plant is called "a lofty shrub" in that work, not acquiring, perhaps, in Lapland the height usual with us. Footstalks perfectly smooth, as well as the midrib, more or less glandular about the top, but scarcely ever producing small accessory leaflets. Stipulas half-heartshaped, strongly toothed, various in size. Catkins on short branches, like the foregoing, but the floral leaves are less abrupt, and straighter; barren ones obtuse, $2\frac{1}{2}$ inches long, dense, with rounded, concave, hairy scales, and from 2 to 5 stamens to each floret, accompanied not unfrequently with an imperfect pistil, as well as a rounded neetary. Scales of the fertile florets rather longer. Germen nearly sessile, smooth, ovate, obtuse, rather compressed, with a neetary like that of the barren florets at its base, on the contrary side to the scale. Style very short, with deeply divided spreading stigmas. Neither the stamens nor the stigmas project much beyond their respective scales. The common receptacle of all the catkins is woolly.

The wood is of little value. Whatever economical or medical uses have been attributed to this Willow belong to the following, which has very generally been mistaken for it, in many parts of England. I have formerly, but erroneously, suspected that Ehrhart's specimens, published as *fragilis*, might rather be our *Russeltiana*. They want full-grown leaves, and barren catkins, but as far as can be determined, they answer to the true *fragilis*;

and having been collected at Upsal, they ascertain this, at least, to be a native of Sweden, which is confirmed by the *Flora Suecica*, where the root, boiled for a considerable time, is said to serve "the country people for staining eggs of a purple colour." A similar practice in Scotland, at Easter, is of very ancient date. See *Anemone Pulsatilla*, v. 3. 36.

20. *S. Russelliana*. Bedford Willow.

Leaves lanceolate, tapering at each end, serrated throughout, very smooth. Footstalks glandular, or leafy. Germen tapering, stalked, longer than the scales. Style as long as the stigmas.

S. Russelliana. *Fl. Br.* 1045. *Engl. Bot.* v. 26. t. 1808. *Rees's Cycl.* n. 39. *Willd. Sp. Pl.* v. 4. 656. *Hook. Scot.* 279. *Purt.* v. 3. 77.

S. fragilis. *Woodv. t.* 198?

In marshy woods, wet meadows, osier-grounds, or hedges, in various parts of Britain.

Tree. *April, May.*

More handsome than the last in its mode of growth, as well as altogether of a lighter or brighter hue. The *branches* are long, straight and slender, not angular in their insertion like *S. fragilis*, and the trees, when stripped of their leaves, may always be distinguished by these marks. They are polished, very tough, flexible, round and smooth. *Leaves* lanceolate, firm, very smooth, except a little silkiness in the bud; their base tapering, not rounded, nor do they at any period approach to the broad ovate form of the preceding; they are strongly, and rather coarsely, serrated throughout; the midrib stouter than the last. *Footstalks* smooth, channelled, glandular, either along their edges, or about the summit, where they occasionally bear 2 or more small lanceolate *leaflets*. *Stipulas* half-ovate, toothed or cut, not constantly present. Fertile *catkins*, which are all I have seen, longer, more lax and tapering than those of *S. fragilis*, their common *receptacle* less downy. *Scales* oblong, either smooth or hairy, deciduous. *Germen* lanceolate, tapering, smooth, on a smooth stalk, at whose base, on the inside, is a large, abrupt, solitary, glandular *nectary*. *Style* equal in length to the deeply divided *stigmas*. The *germen* protrudes, beyond the scale, nearly half its own length.

The foregoing distinctions will always mark this Willow as a separate species from the *fragilis*, which is the more important on account of the wide difference in their qualities and value. *S. Russelliana*, first brought into notice by the late Duke of Bedford, who engaged an able chemist, Mr. Biggin, to make experiments upon it, was found to contain, in its bark, more of the tanning principle, than any other tree of this country, except

the Oak. Hence this bark, taken for *S. fragilis*, has been found useful, as a substitute for the *Cinchona*, in agues ; and if it has occasionally disappointed some medical practitioners, they probably chanced, in such cases, to give the real *fragilis*. Tanners have sometimes been, in like manner, deceived, and they will find it worth their while to observe the character of the tree, in future, before they purchase its bark. On the other hand, when the tree in question was first recommended for cultivation, by the name of the Leicestershire, or Dishley, Willow, it was regarded with scorn, as “ only the Crack Willow,” a sort notoriously useless. This ignorance and prejudice are now removed, and *S. Russelliana* is found the most profitable for cultivation of any species of the genus, for the value of its timber as well as bark, the rapidity of its growth, and the handsome aspect of the tree. A famous Willow, planted by Dr. Johnson at Lichfield, is the *Russelliana* ; as I am assured by the Rev. Mr. Dickenson, who has mentioned it in his edition of Shaw's History of Staffordshire, p. 113, by the name of *fragilis*.

21. *S. purpurea*. Bitter Purple Willow.

Branches trailing, decumbent. Leaves partly opposite, obovate-lanceolate, serrated, very smooth ; narrow at the base. Stamen one. Stigmas very short, ovate, nearly sessile.

S. purpurea. Linn. *Sp. Pl.* 1444. *Fl. Succ.* 347. *Willd.* v. 4. 672. *Fl. Br.* 1039. *Engl. Bot.* v. 20. t. 1388. *Tr. of L. Soc.* v. 6. 113. *Huds.* 427. *Marsch. Taur.-Cauc.* v. 2. 412.

S. monandra. *Arduin. Mem.* 1. 67. t. 11. *Ehrh. Arb.* 58. *Curt. Lond. fasc.* 6. t. 71. f. 5 ; but not of Hoffmann.

S. rubra, minimè *fragilis*, folio longo angusto. *Bauh. Hist.* v. 1. p. 2. 215. f.

In low meadows, about the banks of rivers and ditches, but not common.

In meadows betwixt Norwich and Thorpe. *Mr. Crowe*.

Shrub. *March*.

Trunk 3 or 4 feet high, with long, slender, smooth branches, spreading widely, and, if not supported, trailing on the ground, very smooth, of a rich and shining purple, with a somewhat glaucous hue. *Leaves* partly opposite, partly alternate, on short, smooth, rather stout *footstalks*, without *stipulas*, of a peculiar lanceolate oblong figure, approaching to obovate, minutely pointed, quite smooth, except a slight pubescence in their very youngest state ; broadest, and most distinctly serrated, towards the end ; contracted, and nearly entire, towards the base ; their upper surface of a deep glaucous green ; under more glaucous ; their two sides in some degree unequal, or oblique. *Catkins* earlier than the foliage, and often on different branches, opposite or alter-

nate, almost sessile, solitary, dense, slender, each accompanied by two little, lanceolate, acute leaves; their form exactly cylindrical, bluntish; their length about an inch. *Scales* obovate, hairy, black in their upper half. *Nect.* a single gland opposite to each scale. *Filament* always solitary, simple, smooth, twice the length of the scale. *Anther* tawny, of 4 lobes, and as many cells. *Germ.* sessile, small, broadly elliptical, silky, rather longer than its scale, which is shorter than that of the barren *floret*. *Style* scarcely any till after flowering, when it is slightly protruded. *Stigmas* ovate, thick, obtuse, permanent. *Capsules* hoary, densely downy.

A very valuable osier for fine basket-work, but more especially for platting into low close fences, to keep out hares and rabbits, the leaves and bark being so intensely bitter, that those animals will not touch either. The twigs moreover are so long, tough and flexible, that they may be interwoven into any shape, and kept very close to the ground, as they always retain their horizontal mode of growth. Such a fence is scarcely inferior to one made of wire, and is perhaps more durable, as continually producing young shoots, to supply the place of those that decay. It is important therefore to distinguish this useful and elegant Willow from the following. Ehrhart seems to have led Hoffmann into the great mistake of uniting them, telling him that the *monandra* of Hoffmann, our *Helix*, was the only one in the Upsal garden. Fortunately I have from thence the real *purpurea* so named, in the herbarium of Linnæus, who esteemed it much, and has celebrated its merits in the works above quoted. Ehrhart's own specimen from Hanover is the same; and he was so excellent an observer, that I cannot but think he never saw the *Helix*, nor Hoffmann perhaps the *purpurea*.

22. *S. Helix*. Rose Willow.

Branches erect. Leaves partly opposite, oblong-lanceolate, pointed, slightly serrated, very smooth; linear towards the base. Stamen one. Style nearly as long as the linear divided stigmas.

S. Helix. Linn. *Sp. Pl.* 1444. Willd. v. 4. 672. Fl. Br. 1040. Engl. Bot. v. 19. t. 1343. Tr. of L. Soc. v. 6. 114.

S. monandra. Hoffm. *Sal.* v. 1. 18. t. 1. f. 1. t. 23. f. 1. t. 1. f. 2, 3, also t. 5. f. 1, doubtful. Villars *Dauph.* v. 3. 767. Curt. Lond. fasc. 6. t. 71; except f. 5.

S. n. 1640. Hall. *Hist.* v. 2. 306; excluding the syn. of *Arduino*.

S. humilior, foliis angustis subcæruleis, ex adverso binis. Raii *Syn.* 448.

S. humilior, foliis angustis subcæruleis, ut plurimum sibi invicem oppositis. Raii *Cant.* 144.

S. helice Theophrasti. Dalech. *Hist.* 277. f.

S. rosea Anglica. *Ger. Em.* 1390. *f.* bad.

Salicis racemi seu micamenta, rosæ et capitula squammata. *Bauh. Hist. v. 1. p. 2. 213. f.*

In marshes, osier-holts, and about the banks of rivulets.

Tree. *March, April.*

A tree of humble growth, but erect, about ten feet high, smooth in every part, altogether of a lighter hue than the last; the branches not trailing, but upright, smooth and polished, of a pale yellowish, or purplish, ash-colour, tough and pliable, less slender and elongated than the foregoing, though useful for the coarser sorts of basket-work. *Leaves*, as well as *catkins*, often opposite and alternate on the same plant; the former lanceolate, pointed, much drawn out, as it were, into a linear shape towards the base; finely serrated, chiefly upwards; their colour a light, rather glaucous, green, turning blackish in drying. *Footstalks* short and stout. *Stipulas* none, except on very vigorous shoots, from the roots of trees that have been felled, where they are sometimes of considerable size, half-heartshaped, wavy and obtuse. *Catkins* larger than those of *S. purpurea*, the fertile ones especially full twice as thick, by which invariable and obvious character the two species, when in blossom, are, as Mr. Crowe first observed, readily distinguishable. *Scales* obovate, hairy; their upper half dark brown; those of the fertile florets notched. *Nect.* a tumid gland, opposite to the scale. *Stam.* scarcely longer than the scale. *Anth.* of 4 lobes, and 4 cells. *Germ.* silky, ovate, not elliptical. *Style* smooth, full as long as the linear, cloven, not ovate, *stigmas.* *Caps.* ovate, silky, light brown, accompanied by the permanent styles, stigmas and blackened scales; the whole fertile catkin having that downy aspect noted by Haller, whose plant in Reynier's herbarium is certainly our's. On a more careful scrutiny of Mr. Curtis's excellent plate, the fertile catkins appear to belong to *S. purpurea*, which he was led to consider as the same species. The roselike expansions at the end of the branches, caused by the puncture of an insect, and permanent through the winter, I have never seen but on the *S. Helix*, except once on *S. aurita*, *n.* 50.

The leaves and twigs are less bitter than the former, and the greater size of the trunk, as well as branches, renders this species fit for several purposes which that is not. It also makes a better figure in plantations, and the roots give more solidity to the banks of rivers or ditches.

The *germen* and *stigmas* in Hoffmann's plates do not answer to our plant.

23. *S. Lambertiana.* Boyton Willow.

Branches erect. Leaves partly opposite, obovate-lanceo-

late, pointed, serrated, smooth; rounded at the base. Stipulas none. Stamen one. Stigmas ovate, obtuse, notched, very short, nearly sessile.

S. Lambertiana. *Fl. Br.* 1041. *Engl. Bot.* v. 19. t. 1359. *Willd. Sp. Pl.* v. 4. 673.

In low meadows, osier-grounds, and on the banks of rivers in many places.

On the banks of the river Willy, at Boyton, Wilts, for the course of 16 miles; also in osier-holts near Staines. *Mr. Lambert*. About Lackford bridge, near Icklingham, Suffolk. *Mr. Crowe*.

On the banks of the river near St. Martin's gates, Norwich; also near Henley upon Thames.

Tree. *March, April*.

Of the size and habit of the last, but very distinct from it at first sight, particularly the tender summits of the young growing branches, which, with their purplish glaucous hue, and some degree of downiness, resemble those of a Honeysuckle. *Leaves* frequently opposite, shorter and broader than those of the preceding, dilated upwards, and more or less obtuse at the extremity, with a small point; their base rounded, or abrupt, a little unequal; the margin sharply and distinctly serrated almost throughout, but most above the middle; both sides very smooth; the under glaucous; they turn black in drying. I could never discover any *stipulas*. The *footstalks* are rather short and stout, always very smooth. *Catkins* not more than half the size of those of *S. Helix*, with rounded, blackish, hairy scales. *Nectary* much like that species. *Stam.* longer than the scale, with a four-lobed *anther*. *Germ.* sessile, of a short ovate, or nearly elliptical, tumid shape, densely downy, or silky. *Style* hardly any. *Stigmas* small, ovate, obtuse, spreading, furrowed and finally cloven into two rounded lobes.

Mr. Borrer has sent what I presume to be a variety of this species, found and distinguished by Mr. Woolgar, near Lewes, in which the *leaves* on the upper part of strong shoots are remarkably broad towards the extremity, being almost wedge-shaped; *germen* shorter and more elliptical; *stigmas* with very round and short lobes. Mr. Borrer suggests that what Hoffmann has given as the fertile plant of his *S. monandra*, our *Helix*, is surely this, with which the *germen* and short round-lobed *stigmas* exactly agree, and not at all with those of *Helix*. Whatever this plant may prove, *S. Lambertiana* is doubtless very distinct from *Helix*, differing materially in the form of its *leaves* as well as *stigmas*. The dried *leaves*, especially those of our supposed variety, give a smoky-black stain to papers between which they are laid, which is the case, though less remarkably, with *S. Forbiana*, and some others.

24. *S. Forbiana*. Fine Basket Osier.

Branches erect. Leaves alternate, with small stipulas, lanceolate-oblong, with shallow serratures, smooth; rounded at the base; glaucous beneath. Stamen one. Style nearly as long as the linear divided stigmas.

S. Forbiana. *Fl. Br.* 1041. *Engl. Bot.* v. 19. t. 1344. *Rccs's Cycl.* n. 49. *Willd. Sp. Pl.* v. 4. 674.

S. fissa. *Relh.* 385. *Sm. Tr. of L. Soc.* v. 6. 115; but not of *Hoffmann*.

In meadows and osier-holts, in the eastern part of England.

At Fincham, Norfolk. *Rev. Joseph Forby*. In several osier-grounds near Lynn, Norfolk. *Mr. Crowe*. At Prickwillow, near Ely. *Rev. J. Hemsted*. In many parts of Cambridgeshire truly wild.

Shrub. *April*.

Stem erect, bushy, with upright, slender, smooth twigs, very flexible and tough, of a greyish yellow, not purple, hue, highly esteemed, and much cultivated, for the finer kinds of basket-work. *Leaves* all alternate, very seldom inclining to be opposite, larger than any of the three preceding, and more approaching to a truly lanceolate form, with a small point; their serratures shallow and blunt; upper surface of a deep grass green; under somewhat glaucous; both sides smooth, except a mealy kind of downiness when young. *Footstalks* a little silky, or downy, as is occasionally the *midrib*. *Stipulas* small, lanceolate, acute, often wanting. Fertile *catkins* extremely like those of *S. Helix* in every part, especially the *stigmas*; but the *leaves* are so widely different, that the two species could not, by the most careless observer, be confounded, and the superior quality of the twigs of *S. Forbiana* renders that difference worthy of particular attention. The original plant, sent by Mr. J. Forby to Mr. Crowe, was found now and then to bear a solitary *stamen* at one of the lower *scales* of the fertile *catkins*, which fortunately showed this species to be truly monandrous, and distinct from Hoffmann's *fissa*, to which it had previously been referred, and which proves to be our *rubra*. *S. Forbiana* turns of an inky black in drying.

25. *S. rubra*. Green-leaved-Osier.

Stamens combined below. Leaves linear-lanceolate, elongated, acute, smooth, with shallow serratures; green on both sides. Stigmas ovate, undivided.

S. rubra. *Huds.* 428. *Willd. Sp. Pl.* v. 4. 674. *Fl. Br.* 1042. *Engl. Bot.* v. 16. t. 1145. *Tr. of L. Soc.* v. 6. 116.

S. fissa. *Hoffm. Sal.* v. 1. 61. t. 13, 14. *Ehrh. Arb.* 29. *Willd. Baumz.* 337.

S. virescens. *Villars Dauph. v. 3. 785. t. 51. f. 30.*

S. minimè fragilis, foliis longissimis, utrinque viridibus, non serratis. *Raii Syn. ed. 2. 293. ed. 3. 449.*

S. nerii folio, utrinque virente. *Vaill. Par. 175. Herb. Sherard.*

In low meadows, osier-holts, &c., but rare.

Between Maidenhead and Windsor; also near Salisbury. *J. Sherard*. Near Ely. *Bishop of Carlisle*. At Prickwillow near Ely. *Rev. J. Hemsted*. Cambridgeshire, the barren as well as fertile plant. *Rev. J. Holme*. The latter from Mr. Hudson's herbarium, by the favour of Mr. Lambert.

Tree. *April, May.*

A small tree, with long, upright, smooth, greyish or purplish, more frequently tawny, branches, very tough and pliant, this being one of the most valuable osiers, when cut down annually. Leaves alternate, on rather short, slender, and smooth footstalks, linear-lanceolate, acute, long and narrow, flat, very minutely toothed rather than serrated, of a fine grass green, and smooth, on both sides, being downy when young only. Stipules linear-lanceolate and toothed, rarely observable. Barren catkins stout, obtuse, near $1\frac{1}{2}$ inch long; fertile rather more slender, and in the flowering state shorter. Scales of both obovate, abrupt, or notched, purplish-brown, very hairy. Filaments 2, combined from the base upward about half their length, more or less, each division bearing one orange-coloured anther of 2 cells. Germ. ovate, densely silky, with a large glandular obtuse nectary at its base, opposite to the seale. Style short, with two ovate, thick, undivided stigmas.

No difference of opinion can exist concerning the present species, whose very long and narrow leaves agree in shape with the Common Osier, *S. viminalis*, but want its dense white pubescence. The stamens accord with the next species, differing from all other known *Salices*. The name *rubra* seems to have been originally given to *S. vitellina*, n. 17, a reddish variety of which was founded with this.

26. *S. Croweana*. Broad-leaved Monadelphous Willow.

Stamens combined below. Leaves elliptical, slightly serrated, quite smooth; glaucous beneath.

S. Croweana. *Sm. Tr. of L. Soc. v. 6. 117. Fl. Br. 1043. Engl. Bot. v. 16. t. 1146. Willd. Sp. Pl. v. 4. 676. Winch Guide, v. 1. 89.*

In swampy meadows and thickets.

Discovered by Mr. Crowe, at Cranberry Fen in the parish of East Winch, and in other parts of Norfolk. Mr. Winch first met with the fertile plant near Eggleston, in Teesdale, and in Weredale, Durham. He mentions the barren one as found by the Rev. J. T. Fenwick near Cambo, in Northumberland. Mr.

Dickson appears to have sent the latter to Mr. Crowe formerly we know not from whence.

Shrub. *April, May.*

Stem bushy, usually 4 or 5 feet high, with many stout, irregularly spreading, smooth, leafy, brittle, brownish-yellow *branches*, of no value for any economical use hitherto discovered. *Leaves* alternate, perfectly smooth, on broadish smooth *footstalks*, uniformly elliptical, very rarely inclining to obovate, $1\frac{1}{2}$ inch long, more or less; acute, and often recurved, at the extremity; contracted gradually at the base; the margin copiously though not conspicuously, serrated, or rather crenate; the upper side of a deep shining green; under glaucous, veiny. *Stipulas*, if present, half-heartshaped, rounded, crenate, coloured like the leaves. *Catkins* before the leaves, about an inch long, thickish and obtuse, or elliptic-oblong, almost sessile, with 2 very small *floral leaves*; the barren ones bright yellow, and remarkably ornamental, when young. *Scales* elliptic-oblong, black in their upper half, hairy. *Filam.* much longer than the scales, white, capillary, partially combined, or monadelphous, sometimes at the bottom only, sometimes for half or three-fourths of their length, occasionally unequal. *Anth.* orange-coloured, of 2 cells. *Germ.* sessile, lanceolate, silky. *Caps.* ovate, tapering, downy, tipped with the permanent *style* and *stigmas*, the former of considerable length; the latter ovate, obtuse, long remaining undivided, though finally cloven.

When covered with barren blossoms, this *Salix* is among the most handsome, nor are the leaves destitute of beauty. It has no other value, except to commemorate an ardent and very accurate botanist, whose name is also perpetuated in the beautiful *Crowea saligna* of New South Wales.

27. *S. prunifolia*. Plum-leaved Willow.

Leaves broadly ovate, serrated, smooth on both sides; even above; glaucous beneath. Stem erect, much branched.

Capsules ovate, shaggy, like the scales, with silky hairs.

S. prunifolia. *Fl. Br.* 1054. *Engl. Bot. v.* 19. *t.* 1361. *Rees's Cycl.* n. 55. *Willd. Sp. Pl. v.* 4. 677.

S. myrsinites. *Lightf.* 599. *Herb. Lightf.*

On the Highland mountains of Scotland, frequent.

Shrub. *April, May.*

A bushy *shrub*, often 3 feet high, with spreading *branches*, the whole erect, or ascending, not decumbent. Young *branches* brown, bearing a little short, soft, curved down, not rigid prominent hairs as in the true *myrsinites*. *Leaves* broadly ovate, tolerably uniform, an inch long or rather more, bluntly pointed, serrated throughout, but not deeply; quite smooth, even, of a full shining green, on the upper surface, without any prominent

veins ; glaucous, veiny, when very young only besprinkled with a few silky close hairs, beneath. *Stipulas* minute, unequally ovate, smooth, convex, notched, often wanting. *Footstalks* rather short and stout, smooth, except some occasional downiness on the upper side, which is also found on the midrib of the younger leaves, but by no means constantly. *Catkins* before the leaves, erect, on short, numerous, lateral branches, attended by obovate *floral-leaves*, silky at the back, above half as long as the catkin. *Scales* rounded, or obovate, brown, densely hairy, or rather silky. *Germen* sessile, ovate, longer than the scale, covered with long, silky, white hairs. *Style* at first short, but subsequently becoming longer than the blunt cloven *stigmas*. *Capsule* small, ovate, brown, finally stripped of its hairs.

Living plants of this were sent by Mr. Lightfoot to the Rev. Henry Bryant. The supposed variety with silky-backed *leaves*, mentioned in the *Fl. Br.*, is now reckoned a species ; see the following. *S. myrsinites* of Hoffmann, concerning which I always had some scruples, is referred by Willdenow to his *Ammaniana*, perhaps justly.

28. *S. vacciniifolia*. Bilberry-leaved Willow.

Leaves lanceolate-ovate, serrated ; smooth and even above ; glaucous and silky beneath. Capsules ovate, silky. Stems decumbent.

S. vacciniifolia. *Engl. Bot.* v. 33. t. 2341. *Comp. ed.* 4. 162. *Rees's Cycl.* n. 56.

S. prunifoliae varietas. *Fl. Br.* 1055.

S. myrtilloides. *Donn Cant. ed.* 5. 231 ; *not of Linn.*

On the Highland mountains of Scotland, not unfrequent.

First observed by the Rev. Dr. Walker, and Rev. Dr. Stuart, in Breadalbane, and other places. The late Mr. George Anderson found it plentifully in the south of Scotland.

Shrub. *April*.

Very distinct from the preceding, of a much more humble stature, with decumbent, or trailing, long and slender *branches* ; silky when young, though otherwise smooth. *Leaves* but half the breadth of the *prunifolia* or *venulosa*, covered at the back with close, delicate, almost invisible, silky hairs, and likewise very glaucous ; the *floral ones* ovate, obtuse, on long silky *footstalks*, and beautifully silky at the back, especially when young ; the upper surface of all the leaves even and smooth, nearly as much as in the last. In the fertile *catkins* no great or permanent difference is discernible, except that the *scales* are somewhat more acute, and oblong, or elliptical, as are those of the barren *catkins* also. *Stamens* full twice the length of the scales, perfectly distinct.

29. *S. venulosa*. Veiny-leaved Willow.

Leaves ovate, serrated, naked; reticulated with prominent veins above; rather glaucous beneath. Capsules ovate, silky. Stem erect, much branched.

S. venulosa. *Fl. Br.* 1055. *Engl. Bot.* v. 19. t. 1362. *Comp. ed.* 4. 162. *Rees's Cycl.* n. 57.

In the Highlands of Scotland. *Mr. Dickson*.

Shrub. *April, May*.

In size and general habit this species agrees with my *prunifolia*; but the somewhat narrower leaves differ, I think, materially, on their upper surface, in their prominent, elegantly reticulated, veins, conspicuous in the dried as well as growing specimens, especially towards the margin. The under side is generally less glaucous than in the two last, and in having many close-pressed hairs comes nearest to *vacciniifolia*. *Stipulas* like *prunifolia*. *Catkins* rather more slender, with ovate scales. Capsules silky, smaller, more elliptical, at least while young; but this last character, as well as the proportion of the style and stigmas, is perhaps variable.

Mr. Edward Forster, of whose opinions, as well as observations, I well know the value, thinks the present plant only a variety of *S. prunifolia*. He has cultivated them, as I have done, and botanists who have equal experience must decide between us. Prof. Willdenow referred my *venulosa*, with doubt, to his own *formosa*; but some very complete specimens of this latter, sent by Mr. Sieber from Carinthia, prove distinct. Nothing can be more truly different from all of them in size, mode of growth, and characters, properly considered, than *vacciniifolia*.

30. *S. myrsinites*. Green Whortle-leaved Willow.

Leaves elliptical, serrated, smooth, veiny; polished on both sides. Young branches hairy. Germens stalked, downy. Capsules awl-shaped.

S. myrsinites. *Linn. Sp. Pl.* 1445. *Fl. Lapp.* n. 353. t. 7. f. 6. t. S. f. f. *Willd.* v. 4. 678. *Fl. Br.* 1054. *Engl. Bot.* v. 19. t. 1360; excl. the references to *Hoffmann*. *Villars Dauph.* v. 3. 769. t. 50. f. 12; bad. *Wahlenb. Lapp.* 262.

S. retusa. *Dicks. Tr. of L. Soc.* v. 2. 288; from the author.

S. n. 1645. *Hall. Hist.* v. 2. 308.

β. *S. arbutifolia*. *Willd.* v. 4. 682; according to Prof. Mertens.

S. myrsinites. *Fl. Dan.* t. 1054.

S. pumila, folio utrinque glabro. *Bauh. Hist.* v. 1. p. 2. 217. f.?

In the Highlands of Scotland.

On the mountains of Glen-co. *Rev. Dr. Stuart*. On the Clova mountains. *Mr. Thomas Drummond*.

Shrub. *May, June.*

A sturdy, upright, bushy *shrub*, 1 to 2 feet high, with abundance of short, leafy, dark-purplish *branches*, hairy when young, not downy. *Leaves* very different from all the foregoing species, except *S. malifolia*, in their rigid, thin, crackling, veiny texture, without any thing glaucous or cottony about them, the fine hairs on the younger ones being scattered and silky. Both sides are of the same greyish green, and both alike veiny, with fine, prominent, reticulated veins, meeting at right angles. The shape is either elliptical, in some degree approaching to orbicular; or in the variety β obovate-lanceolate; all slightly pointed; the length about an inch or rather more; the margin finely, but sharply and distinctly, serrated. *Footstalks* short, thick, smooth. *Stipulas* unequally ovate, strongly toothed, smooth, variable in size. *Catkins* solitary, terminal, cylindrical, thick and obtuse, hoary with the abundant long hairs of the brown, elliptic-oblong, notched *scales*. *Nect.* obtuse, notched. *Stam.* 2, twice the length of their scale. *Germ.* stalked, awl-shaped, downy, tapering into a smooth short *style*. *Stigmas* thick, distant, deeply divided.

Caps. brown, tapering, downy, especially towards the bottom.

The *leaves* frequently remain, withered and bleached, through the winter. They are so unlike those of other small Willows, at least of all the preceding, in being of the same shining green on both sides, that the species cannot be mistaken. Their shape, though different in the two extremes, may clearly be traced from one variety to the other.

31. *S. Dicksoniana*. Broad-leaved Mountain Willow.

Leaves elliptical, acute, slightly toothed, smooth; glaucous beneath. Young branches very smooth. *Catkins* ovate, short, erect. *Germen* stalked, ovate, silky. *Stigmas* nearly sessile.

S. Dicksoniana. *Engl. Bot.* v. 20. t. 1390. *Rees's Cycl.* n. 60. *Willd. Sp. Pl.* v. 4. 696. *Ait. Hort. Kew. ed. 2.* v. 5. 362.

S. myrtilloides. *Fl. Br.* 1056; but not of *Linnaeus*.

In the Highlands of Scotland. *Mr. Dickson*.

Received from Scotland by *Mr. Winch*.

Shrub. *April.*

Stem upright, about a foot high, perfectly smooth, like every part of the herbage, even the youngest *leaves* and *branches*; the latter are round, erect, green the first year, afterwards brown. *Leaves* an inch or inch and half long, elliptical, with a small broadish point, flat, with very shallow tooth-like serratures; the upper surface bright green, even; under glaucous, finely veined. *Footstalks* short, and rather stout. *Stipulas* half-ovate, very minute, and often wanting. *Catkins* before the foliage, almost sessile, each accompanied by 2 or 3 oblong-lanceolate *floral leaves*,

somewhat silky at the back. They are ovate and short, erect, but hardly rising above the floral-leaves, very dense, with brown, oblong, notched *scales*, clothed with copious, long, silky hairs. *Nect.* an oblong, tumid, notched gland. *Stam.* not observed. *Germ.* on a longish smooth stalk, elevated somewhat above the scale, ovate, densely downy. *Style* scarcely any. *Stigmas* ovate, obtuse, yellow, large and thick, at an advanced period perhaps divided.

The short ovate *catkins*, in which the present *Salix* differs from all we have hitherto described, and agrees with a few other dwarf species, particularly the *rosmurinifolia* and *Arbuscula*, as soon as they appeared in Mr. Crowe's garden proved this to be distinct from *S. myrtilloides*, for which it had previously been taken. No Willow is more decidedly smooth in every part but what belongs to the fructification; nor is the shape or proportion of the leaves liable to variation. Its name commemorates that great British botanist, who discovered it among his own native hills, and who has gathered and discriminated more species perhaps of this genus than any other person. His discoveries are every day confirmed, as well as his remarks.

The *germens* of the real *S. myrtilloides*, not yet found in Britain, are quite smooth, in lax cylindrical *catkins*, and the *leaves* perfectly entire. Willdenow has mistaken *smooth* for *downy* in my description of the *leaves* of *S. Dicksoniana*.

32. *S. carinata*. Folded-leaved Willow.

Leaves ovate, finely toothed, smooth, minutely veined, folded into a keel. Catkins cylindrical, with rounded, hairy scales. Germen sessile, ovate, silky.

S. carinata. *Fl. Br.* 1055. *Engl. Bot. v.* 19. *t.* 1363. *Rees's Cycl.* n. 63. *Willd. Sp. Pl. v.* 4. 680.

In the Highlands of Scotland. *Mr. Dickson*.

Sent from Scotland, in 1807, by the *Rev. Dr. Stuart*.

Shrub. *April*.

Larger and more erect than *S. prunifolia* or *venulosa*, to both which it is nearly related in the fertile *catkins*. These are cylindrical, slender, erect, twice the length of the silky-backed *floral-leaves*, and quite unlike the short, dense, ovate *catkins* of the last-described species. Their *scales* are rounded, concave, abrupt, half as long as the *germen*, and clothed at the outside with long hairs. *Germen* sessile, ovate, densely silky. *Style* smooth, very short. *Stigmas* ovate, short and thick, finally notched. The *branches* are elongated, brown, very slightly hairy when young. *Leaves* elliptic-ovate, near an inch and half long, dark green, minutely and copiously toothed, acute, smooth on both sides, except in the bud, where they are externally silky. They are very remarkably recurved, keeled, and folded, so that, having a con-

siderable degree of rigidity, they cannot be pressed flat. Both sides are finely veiny; the under one somewhat glaucous. *Footstalks* short and thick. *Stipulas* extremely minute, half-ovate. A prominent tooth remains on the older branches, where each footstalk stood. The *leaves* clearly distinguish this Willow from every other, though the fructification shows an affinity to the *prunifolia* and *venulosa*, next to which it ought perhaps to have been placed; but Willdenow was not acquainted with the *catkins*. These are totally unlike the short ovate ones of the last, or the following.

33. *S. Arbuscula*. Little Tree Willow.

Leaves lanceolate, acute, obscurely toothed, smoothish; glaucous beneath; silky when young. Branches downy. Catkins ovate, erect. Germen stalked, ovate-lanceolate, silky.

S. Arbuscula. *Linn. Fl. Lapp. n.* 360. *ed.* 2. 297. *t.* 8. *f. m.* *Sp. Pl.* 1445 γ . *Willd. v.* 4. 681? *Fl. Br.* 1050. *Eugl. Bot. v.* 19. *t.* 1366. *Rees's Cycl. n.* 65. *Wahlenb. Lapp.* 263. *t.* 16. *f.* 2? omitting the reference to *Linn. Fl. Lapp.* which is *S. tenuifolia*.

In the Highlands of Scotland. *Mr. Dickson*.

Shrub. *April*.

Stem erect, slender, about a foot high, naked below, like a little tree; the *branches* spreading, round, light brown; downy when young; in their earliest state rather silky. *Leaves* on short, but slender, *footstalks*, moderately spreading, about an inch and half long, lanceolate, flat, narrow, acute, contracted at each end, very minutely and distantly toothed, so as to appear entire unless carefully examined; the principal lateral *veins* parallel, though their ultimate ramifications form right angles; the upper surface smooth, of a light, but rather dull, green; under more or less glaucous, partly silky with close hairs; the youngest frequently silky, or silvery, all over. *Stipulas* none, except on young radical shoots, when the whole shrub is cut down, on which the *leaves* become not longer, but broader, somewhat elliptical, with minute, ovate, close *stipulas*. *Catkins* numerous, ranged along the leafless branches, on short stalks, with a few lanceolate, tapering, hairy *floral-leaves* to each, which are as long, or longer, than the little upright ovate hoary *catkin*, whose *scales* are blackish, or purplish, obovate, notched, densely bearded, each accompanied by a small pale *nectary*. *Germen* ovate-lanceolate, silky, stalked. *Style* very short, with large, broad, obtuse, tawny *stigmas*.

The plant here described is the authentic type of *S. Arbuscula*, with which Linnæus associated, in his *Species Plantarum*, two other very distinct species, our *tenuifolia*, and the *foliolosa*, *Fl. Lapp. ed.* 2. *n.* 356. He never saw the *catkins* of *S. Arbuscula*, which by

their short ovate figure assist materially in characterizing the species, agreeing most with those of *S. Dicksoniana*, from which the *leaves* of the present widely differ in form and silkiness. Nevertheless, when the plant is cut down, the strong radical shoots produce much broader, and partially elliptical *leaves*, approaching to the universal shape of *Dicksoniana*, but are still silky when young. Cultivation from seed, if possible, could alone determine whether the plants vary into each other. We know nothing of the barren *flowers*. The *catkin* in Dr. Wahlenberg's t. 16. f. 2, is twice the length of our *Arbuscula*, and much more lax, nor do the *leaves* agree.

34. *S. livida*. Livid Dwarf Willow.

Leaves elliptic-oblong, obscurely toothed, smooth; livid beneath. Stipulas none. Germen nearly cylindrical, downy; its stalk twice as long as the scale. Stigmas nearly sessile.

S. livida. *Wahlenb. Lapp.* 272. t. 16. f. 6; *exclusive of all the synonyms. Hook. Scot.* 281.

In the Lowlands of Scotland. *Dr. Hooker.*

At the foot of Hertfell, near Moffatt. *Mr. Maughan.*

Shrub.

Very smooth in almost every part, about a foot high, the young *branches* spreading widely, and partly recumbent, with a yellowish bark, which in its earliest state is a little downy, with curved hairs. *Leaves* three quarters of an inch long, elliptical, slightly dilated upwards, equally contracted at both ends, but not acute; distinctly, but not deeply, serrated or toothed; the smallest veins reticulated at right angles; the upper side green and shining; under, as Wahlenberg observes, livid rather than glaucous. *Footstalks* short and stout. *Stipulas* never seen by the eminent botanist last named, in any state, or supposed variety, of the plant. *Catkins*, according to him, lax, on short stalks, with 1 or 2 *floral leaves*; their common receptacle finely downy, as well as the *stalks* of the *germens*, which are twice the length of the little, ovate, likewise downy, *scales*. *Germen* long and cylindrical, more thickly downy. *Stigmas* almost sessile.

I have seen only a branch or two with the *leaves*, communicated by my friend Dr. Hooker, which altogether agrees with the above description; what regards the *fructification* is borrowed from Dr. Wahlenberg's work. I cannot refer this Willow to any described species, nor to any of the Linnean specimens.

35. *S. herbacea*. Least Willow.

Leaves orbicular, serrated, reticulated with veins, very

smooth and shining on both sides. Germen stalked, ovate-lanceolate, smooth.

S. herbacea. *Linn. Sp. Pl.* 1445. *Fl. Lapp. ed.* 2. 294. *t.* 8. *f.* h. *t.* 7. *f.* 3, 4. *Willd. v.* 4. 682. *Fl. Br.* 1056. *Engl. Bot. v.* 27. *t.* 1907. *Gramm. t.* 5. *f.* 85—87. *Hook. Scot.* 283. *Fl. Dan. t.* 117. *Hoffm. Sal. v.* 1. 74. *t.* 20. *Wahlenb. Lapp.* 260.

S. n. 1649. *Hall. Hist. v.* 2. 309.

S. alpina, alni rotundo folio, repens. *Dill in Raii Syn.* 448. *Bocc. Mus. t.* 1.

S. alpina minima, lucida, repens, alni rotundo folio. *Bocc. Mus. 19. t.* 1.

S. saxatilis minima. *Bauh. Pin.* 474. *Prodr.* 159.

On the summits of the loftiest mountains of England, Scotland and Wales, in a micaceous soil.

On Snowdon. *Sherard.* On the tops of all the Highland Alps. *Lightf.* On Skiddaw, Cumberland. *Mr. Crowe and Mr. Woodward.*

Shrub. *June.*

This is reckoned the least of all *shrubs*, the *stems* though woody, perennial, and often branched, being only an inch or two in height, partly decumbent, very slender, and, like every other part of the plant, quite smooth. The *roots* are much stouter, woody, from 1 to 2 feet long, copiously branched, sending up abundance of the abovementioned little *stems*, and fixed in the earth and stones by copious fibres. *Leaves* on short *stalks*, alternate, pretty accurately orbicular, about half an inch broad, bright green, smooth and shining, as well as beautifully reticulated with prominent veins on both sides. *Stipulas* none. *Catkins* of but few flowers, terminal, solitary, stalked, erect, naked, cylindrical, with obovate, or roundish, fringed, yellowish *scales*. *Stam.* 2, distinct, rather longer than their scale. *Nect.* a double gland. *Germ.* on a shortish stalk, ovate, tapering, very smooth, as is, of course, the reddish *capsule*. *Style* short, subsequently elongated, permanent, with the small cloven *stigmas*. The *scales* of the fertile *catkins* are smooth, fewer, and more oblong, than in the others.

The Laplanders, according to Dr. Wahlenberg, call this the Ptarmigan leaf.

**** *Adult leaves entire, nearly smooth.***

36. *S. reticulata.* Wrinkled Willow.

Leaves orbicular, somewhat elliptical, obtuse, entire, coriaceous, with reticulated veins, nearly smooth; glaucous beneath. Germen sessile, downy.

S. reticulata. *Linn. Sp. Pl.* 1446. *Fl. Lapp. ed.* 2. 296. *t.* 8. *f.* 1. *t.* 7. *f.* 1, 2. *Willd. v.* 4. 685. *Fl. Br.* 1057. *Engl. Bot. v.* 27. *t.* 1908.

Dicks. Dr. Pl. 44. *Hook. Scot.* 283. *Fl. Dan.* t. 212. *Hoffm. Sal.* v. 2, 3. t. 25—27. *Wahlenb. Lapp.* 262.

S. n. 1650. *Hall. Hist.* v. 2. 309.

S. pumila, foliorotundo. *Bank. Hist.* v. 1. p. 2. 217. f. *Raii Syn.* 449.

On the loftiest mountains of Yorkshire, Wales and Scotland.

Upon Ingleborough and Whern-side, Yorkshire; T. Willisell. *Ray*.

On the tops of the highest mountains of North Wales. *Ray*.

On many of the Highland mountains, in a micaceous soil. *Light-foot*.

Shrub. *June*.

Larger than the last, with stout, woody, procumbent *stems* and *branches*, either mantling the Alpine rocks, or spreading on the ground, in large patches. *Leaves* 3 from each bud, on long slender *footstalks*, without *stipulas*, alternate, nearly orbicular, or somewhat elliptical, an inch broad, firm, coriaceous, though deciduous, entire, with an occasional notch at the end; the upper surface wrinkled, of a deep shining green; under very glaucous, or whitish, beautifully reticulated with abundance of prominent veins, now and then somewhat silky, but I have not seen them so in British specimens, except perhaps when very young. The summit of each *footstalk* is often bearded with silky hairs. *Catkins* solitary at the end of the same *branch*, above the leaves, each on a simple, often downy, leafless *stalk*, longer than the *footstalks*, exactly cylindrical, obtuse, reddish, dense, many-flowered, about an inch long, with obovate, partly woolly, *scales*. *Stam.* 2, distinct, twice the length of the scales, with an awl-shaped *nectary* at their base. *Germ.* ovate, often curved, sessile, downy; sometimes, if not always, with a *nectary* of 4 club-shaped glands at its base. Hoffmann represents a single gland only, and it is possible the 4 glands drawn in *Engl. Bot.* may be accidental. *Stigmas* nearly sessile, deeply divided. *Caps.* ovate, tumid, brown, downy or cottony, twice as long as the close-pressed, permanent scale.

A most elegant little Willow, which, as Dr. Wahlenberg remarks, seems scarcely related to any other. Yet the spreading woody *roots*, dwarf *stems*, round veiny *leaves*, and terminal long-stalked *catkins*, coming after the foliage, from the same bud, and unattended by *floral-leaves*, accord singularly with *S. herbacea*; to which the plant before us, however widely and essentially distinct as a species, is evidently akin. *S. polaris*, *Wahlenb. Lapp.* 261. t. 13. f. 1, belongs to the same tribe.

*** *Leaves all shaggy, woolly, or silky.*

37. *S. glauca*. Glaucous Mountain Willow.

Leaves nearly entire, elliptic-lanceolate; even and nearly smooth above; woolly and snow-white beneath. *Footstalks* decurrent. *Germen* sessile, ovate, woolly.

S. glauca. *Linn. Sp. Pl.* 1446. *Fl. Lapp. ed.* 2. 299. *t.* 8. *f.* p. *t.* 7. *f.* 5; but not *S. sericea* of Villars. *Engl. Bot.* v. 26. *t.* 1810. *Comp. ed.* 4. 162. *Rces's Cycl.* n. 84. *Hook. Scot.* 283. *Willd. Sp. Pl.* v. 4. 687. *Wahlenb. Lapp.* 264. *t.* 16. *f.* 3.

S. appendiculata. *Fl. Dan.* *t.* 1056.

S. n. 1642. *Hall. Hist.* v. 2. 307. *t.* 14. *f.* 2.

In the Highlands of Scotland. *Mr. Dickson*.

On the Clova mountains; *Mr. G.* and *Mr. D. Don.* *Hooker*.

Shrub. *May*.

Stem 2 or 3 feet high, stout, bushy, with numerous short, round, spreading, brown or yellowish *branches*, downy in their early state. *Leaves* near 2 inches long, and half, or three quarters, of an inch wide, elliptic-lanceolate, acute, often broadest rather above the middle, somewhat rounded at the base, nearly, if not in every part, quite entire; the upper side of a beautiful glaucous green, remarkably even, perfectly smooth when full grown; under densely downy, or cottony, of no less elegant and pure a white, with slightly prominent veins, and a reddish midrib. *Stipulas* small, convex, ovate, or rounded, as represented in *Fl. Dan.* but often wanting. *Footstalks* rather stout, reddish, a little downy; their base dilated and keeled, meeting a similar projection of the branch at their insertion, as in *S. lanceolata*, *n.* 3. *Buds* elliptical, brown, downy, rather large. *Catkins* solitary, on short, lateral, downy branches, with 2 elliptical, stalked, *floral-leaves*, which are very silky at the back, and become near an inch long by the time the *seeds* are ripe; erect, cylindrical, stout, dense, many-flowered. *Scales* ovate, blackish, densely hairy. *Nect.* a solitary oblong gland. *Stamens* 2, capillary, yellow, many times longer than the scale. *Germen* at first sessile, ovate, twice the length of the scale, thickly covered with very white down, and afterwards becoming a tawny, less downy, somewhat stalked, *capsule*. *Style* short in the flower, with thick ovate *stigmas*; much elongated as the *fruit* ripens, the *stigmas* linear and deeply cloven.

Haller's plate well represents this handsome species, insomuch that one cannot but wonder at its having been enveloped in any obscurity. Authentic Swiss specimens answer precisely to those of Linnæus, and the plant remains unchanged by many years' culture. Wahlenberg unites it with *S. lapponum*, which I cannot but think the *arenaria* of *Fl. Dan.* *t.* 197, whatever *t.* 1058 of the same work may be. *S. sericea* of Villars, according to his own specimens, is the true *lapponum*, and I have Swiss ones, properly so named, from M. Schleicher. It is Haller's *n.* 1643. This species, as yet, has not been noticed in Britain. The *leaves* are 2 or 2½ inches long, greyish, all over very silky, both sides alike, at every period of their growth, and never cottony; the *catkins* large, with large *floral-leaves*, like the proper foliage; and oblong hairy *scales*; the *germens* and *capsules* sessile, pe-

euliarly woolly. Nothing surely can be better marked as a species, either in the *leaves* or *fructification*; though I must scruple to dissent in this opinion from Dr. Wahlenberg, who has studied the plants wild, and who cannot be supposed unacquainted with *S. lapponum*. Dr. Swartz however did not know it, and even Linnæus has, on more than one occasion, confounded it with his *arenaria*, gathered by himself, at the same time, in Lapland; and likewise with our *Stuartiana*.

38. *S. Stuartiana*. Small-leaved Shaggy Willow.

Leaves nearly entire, ovate-lanceolate, acute; shaggy above; densely silky, somewhat cottony, beneath. Style as long as the almost sessile, woolly germen. Stigmas capillary, deeply divided, the length of the style.

S. Stuartiana. *Engl. Bot.* v. 36. t. 2586. *Comp. ed.* 4. 162. *Rees's Cycl.* n. 85.

S. arenaria maseulina. *Fl. Br.* 1059. *Engl. Bot.* v. 26. p. 1809.

S. lapponum. *Fl. Dan.* t. 1058?

In the Highlands of Scotland.

In Breadalbane. *Rev. Dr. Stuart*. Near the upper end of the burn at Finlarig. *Mr. W. Borrer*. On Ben Lawers. *Mr. D. Turner*. Received from Scotland by the late Mr. T. F. Förster, in whose garden its distinctive characters remained, with very little variation.

Shrub. *July, August*; probably also in the early Spring.

Bushy and copiously branched, 2 or 3 feet, or rather more, in height; the *branches* dark brown, downy when young and leafy; cottony or silky at the tops. *Leaves* scarcely more than half the size of the foregoing or the following, and more lanceolate, rarely somewhat obovate, sharp-pointed, sometimes slightly wavy, or toothed; the upper surface greyish-green, shaggy or silky, partly denudated by culture, always very even, not wrinkled or veiny; the under side whiter, and more densely silky, partly cottony, with obscure veins, and a reddish midrib. *Foot-stalks* downy, rather slender, with a slight projection of the branch under each. *Stipulas* I think entirely wanting. *Catkins* from large lateral *buds*, short, ovate-oblong, on short stalks, with 2 or 3 lanceolate, *floral-leaves*. *Scales* blackish, ovate, densely bearded. *Stam.* 2, not much protruded. *Germ.* very nearly, if not quite, sessile, the length of the scale, ovate-oblong, woolly. *Style* slender, as long as the germen. *Stigmas* divided to the base, into capillary acute segments, hardly shorter than the style itself, which, together with the extraordinary length of that part, abundantly distinguish this species from all but the following. *Capsule* ovate, cottony or woolly, retaining the style and stigmas.

Tab. 1058 of the *Fl. Dan.* named *S. lapponum*, answers in many particulars to this species, though I know no Willow whose *styles*, or *stigmas*, exactly resemble that figure. The true *lapponum* is represented in *t.* 197 of that work, for *arenaria*, as already mentioned.

39. *S. arenaria*. Downy Mountain Willow.

Leaves nearly entire, ovate, acute; reticulated and somewhat downy above: veiny and densely woolly beneath. Style as long as the sessile woolly germen. Stigmas linear, deeply divided, the length of the style.

S. arenaria. *Linn. Sp. Pl.* 1447. *Fl. Lapp. cd.* 2. 298. *t.* 8. *f.* o, q. *Fl. Br.* 1058. *Engl. Bot.* v. 26. *t.* 1809. *Rees's Cycl.* n. 90. *Hook. Scot.* 283, excluding *S. Stuartiana*. *Willd. Sp. Pl.* v. 4. 689; excl. *Fl. Dan.* *t.* 197, and *Hall.* n. 1642.

S. foliis integerrimis ovatis acutis: supra subvillosis, subtus tomentosis. *Linn. Gothl.* 206.

S. lapponum. *Lightf.* 604. *Huds.* 651.

S. helvetica. *Villars Dauph.* v. 3. 783; from the author; excl. *Hall. syn.*

S. limosa. *Wahlenb. Lapp.* 265.

S. n. 20. *Gmel. Sib.* v. 1. 164. *t.* 36. *f.* 1; excl. *Ray's syn.* From the author in *Herb. Linn.*

On mountains in Scotland. *Mr. Dickson.*

In Breadalbane. *Rev. Dr. Stuart, and Mr. W. Borrer.* On the Clova mountains. *Mr. G. Don.*

Shrub. *May, June.*

A larger and stouter shrub than the last, of which it was supposed, by the original finder, to be the fertile plant; but barren as well as fertile individuals of both species, agreeing exactly together in other respects, and differing alike from correlative ones of the other species, are now well known. In size and general habit, this most resembles *S. glauca*, but their discriminative marks are clearly discernible. The leaves of *arenaria* are rather smaller and shorter, more precisely ovate, with a little sharp point; their upper surface dark green, reticulated with sunk veins, and clothed with thin cottony down, more dense and soft upon the young ones; the under side pure white, with close, dense cottony wool; the veins prominent; midrib reddish; the youngest, as well as floral ones, beautifully silky beneath. Stipulas none. Footstalks broad at the base, not decurrent, though with some swelling of the branch below their insertion. Catkins on short lateral branches, with a few floral-leaves; barren ones ovate, short and thick; fertile longer, cylindrical. Scales of each ovate, more or less acute, blackish, copiously bearded. Nect. oblong, obtuse. Stam. twice the length of the scale. Germ. sessile, ovate, acute, covered with thick white wool.

Style almost as long as the germen, slender, with linear *stigmas*, nearly its own length, not quite so deeply divided, nor so taper-pointed, as in *S. Stuartiana*, with whose parts of fructification, and not with those of any other neighbouring species, the Willow before us most agrees. The *capsule* is ovate, permanently woolly, smaller than that of *S. glauca*.

Wahlenberg changes the name *arenaria* for *limosa*, because he found this species in marshes and boggy situations all over Lapland. The same learned writer gratuitously asserts that Linnæus confounded it with my *S. argentea*, gathered in his Gothland journey, in sandy ground, and thence called it *arenaria*. Now the very extraordinary error of referring the plant of Dillenius, figured in his edition of Ray, to that under our present consideration, originated, not with Linnæus, but with Gmelin, who sent him a Siberian specimen of my *S. Stuartiana*, marked with the synonym of Dillenius. Gmelin moreover, like Linnæus, confounded the *Stuartiana* with the real *arenaria*, which latter is exhibited in his *Flora Sibirica*; but Linnæus has not, in his Gothland Tour, adverted to Ray's *Synopsis*, nor to any thing else than his own Lapland plant, which exclusively answers to the definition he gives. So hazardous is conjectural criticism, unsupported by authorities! Dr. Hooker very judiciously avoided being misled by Wahlenberg. The latter further errs in considering *Engl. Bot. t. 1810* as a representation of this species, rather than of *S. glauca*. Justice to my deceased friend Sowerby obliges me to declare, that his plate is a peculiarly faithful representation of the *glauca*, and its short *style* is decisive.

40. *S. lanata*. Woolly Broad-leaved Willow.

Leaves roundish-ovate, pointed, entire; shaggy on both sides; glaucous beneath. Germen sessile, oblong, smooth. *Style* four times as long as the blunt, divided stigmas.

S. lanata. *Linn. Sp. Pl.* 1446. *Fl. Lapp. ed.* 2. 302. *t.* 7. *f.* 7. *t.* 8. *f.* x. *Tour in Lapl.* v. 1. 77. v. 2. 279. *Willd.* v. 4. 688. *Sm. in Rees's Cycl.* n. 88. *Wahlenb. Lapp.* 259. *t.* 16. *f.* 1; a, b, c.

S. caprea. *Fl. Dan.* t. 245.

S. chrysanthos. *Fl. Dan.* t. 1057. *Willd.* v. 4. 704. *Rees's Cycl.* n. 127.

On rocks in the Highlands of Scotland.

Found by Mr. T. Drummond, on rocks amongst the Clova mountains, but sparingly. *Mr. W. Robertson.*

Shrub.

Stem 3 or 4 feet high, with numerous thick distorted branches, downy when young. *Leaves* broader than those of any British Willow, except *caprea*, on shortish stout *footstalks*, elliptical,

or roundish, with a short oblique point, entire, though somewhat wavy, from $1\frac{1}{2}$ to $2\frac{1}{2}$ inches long; occasionally heart-shaped at the base; sometimes more obovate, inclining to lanceolate, and the earlier ones much smaller; all of a hoary, or grey aspect, being covered, more or less completely, with long, soft, silky, shaggy hairs, especially the upper surface; the under is more glaucous, beautifully reticulated with veins. *Stipulas* ovate, acute, hairy, veiny. *Catkins* terminal, large, and very handsome, bright yellow; the barren ones proceed from lateral *buds* in *Fl. Dan.* t. 1057. I have seen fertile ones only, on Lapland specimens; the Scottish ones being destitute of both. Wahlenberg says, "the *catkins* always come from terminal *buds*, and are sessile, without *bracteas*, erect, straight, often as thick as the thumb, and as long as the middle finger; shining all over with a golden splendor, caused by the abundant hairs of the *scales*. Each *scale* is more than half the length of the *germen*, its shaggy hairs concealing the whole *pistil*. *Germen* larger than in other species, quite sessile, perfectly smooth, green, not yellowish, conical, or tapering from a broad base to a point, compressed. *Style* nearly as long as the *germen*, divided. *Nectary* of the barren flowers a thick, almost cylindrical, abrupt, solitary gland, at the inner side. The fruit-bearing *catkin* generally attains the length of a span." Our Linnæan specimens, some wild, some cultivated, answer to this description. The 2 *stamens*, and *nectary*, are orange-coloured in the *Fl. Dan.*

Dr. Wahlenberg justly observes that "this is the most beautiful Willow in Sweden, if not in the whole world. The splendid golden *catkins*, at the ends of the young branches, light up, as it were, the whole bush, and are accompanied by the young foliage, sparkling with gold and silver. It yields more honey than any other *Salix*, insomuch that the *catkins* are sweet in the mouth, and are much frequented by alpine bees. From the marginal glands of the *stipulas*, and sometimes from those of the *leaves*, a gummy exudation proceeds, staining paper in which the plant is dried, like *S. pentandra*." These glands are not always discernible, at least in dried specimens.

Even without fructification, this species is strikingly different from every other, and bears hardly the remotest affinity to *S. arenaria* or *glauea*. Haller's n. 1651 has been taken for *S. lanata*, which it certainly is not. The son of that eminent botanist assured Mr. Davall of several different things being confounded under this n^o., which every Swiss collection, that I have seen, confirms.

41. *S. argentea*. Silky Sand Willow.

Leaves elliptical, entire, somewhat revolute, with a recurved point; rather downy above; silky and shining beneath, as well as the branches. Stem upright. *Germen* ovate-

lanceolate, silky; its silky stalk nearly equal to the linear-oblong scale. Style not longer than the stigmas.

S. argentea. *Fl. Br.* 1059. *Engl. Bot.* v. 19. t. 1364. *Rees's Cycl.* n. 98. *Willd. Sp. Pl.* v. 4. 693.

S. repens γ . *Huds.* 429; but not n. 1643 of Haller.

S. arenaria. *Lightf.* 604. *Huds. ed.* 1. 364.

S. lanata. *Roth Germ.* v. 1. 418. v. 2. p. 2. 513; according to Willdenow.

S. pumila, foliis utrinque candicantibus et lanuginosis. *Dill. in Raii Syn.* 417. t. 19. f. 3; but not of *C. Bauhin*.

On the sea shore, among loose blowing sand-banks.

By Sandown castle, Kent. *J. Sherard*. Laugharn, South Wales.

Mr. Hurlock. In various other places.

Shrub. *May*.

Stems mostly spreading, but if sheltered erect, 4 or 5 feet high, with numerous, upright, leafy branches, beautifully downy or silky. *Leaves* on short, stout, downy footstalks, scattered, an inch, or often less, in length, and half as much in breadth, truly elliptical, with a small curved point; the margin entire, slightly revolute; the upper side of a dull green; at first silky, then downy, finally naked, reticulated with small veins; under covered at all times with the most brilliant, silvery, satin-like, close, silky hairs, very soft, almost concealing the strong midrib and transverse veins. *Stipulas* ovate, entire, flat, silky, more or less stalked, variable in size. *Catkins* before the leaves, lateral, at first sessile, afterwards elevated on small bracteated stalks, cylindrical, thick, obtuse, an inch long. *Scales* narrow-obovate, rounded at the end, bearded, their upper half black; those of the barren catkins almost linear. *Stam.* 2, smooth, about the length of the scale. *Nect.* a small, obtuse, oblong gland, like that of the fertile *florets*, whose scale is broader than the barren one. *Germ.* on a silky stalk nearly as long as the scale, lanceolate, densely woolly, or silky, tumid at the base. *Style* at first short; subsequently equal to the stigmas, which are cloven and blunt. *Capsules* becoming smoother as they ripen. The length of their partial stalks appears variable.

With the present species we enter on a peculiar tribe of *Salices*, natives either of pure sand, or of heathy elevated situations. Hudson unites them all under his *repens*, along with a most distinct one, the *rosmarinifolia*, whose leaves are linear. The rest have elliptical foliage, mostly entire, peculiarly silky underneath. They are of humble stature, more or less recumbent, and often matted, or entangled, in their growth. Though the species of this tribe may be difficult to define, like those of the whole genus *Rosa*, which my learned friend Gerard, in his *Flora Galloprovincialis*, reduced all into one; yet a patient inquirer will

find the labour of discrimination as satisfactory in one case as the other.

Dillenius represents the leaves of *S. argentea* more oblong, and more narrow, than usual. Yet his quotation of Bauhin, though erroneous, and especially the observation copied from Ray's second edition, 291, clearly ascertain what he intended.

42. *S. fœtida*. Fishy Willow.

Leaves elliptical, nearly entire, with a recurved point; glaucous and silky beneath. Stem recumbent. Germen ovate-lanceolate, on a silky stalk nearly equal to the obovate scale.

S. adscendens. *Engl. Bot.* v. 28. t. 1962. *Comp. ed.* 4. 163. *Rees's Cycl.* n. 103. *Ait. Hort. Kew. ed.* 2. v. 5. 361.

S. alpina pumila, *rotundifolia*, *repens*, *infernè subcinerea*. *Dill. in Raii Syn.* 448.

S. humilis. *Ger. Em.* 1391. f?

β. *S. parvifolia*. *Engl. Bot.* v. 28. t. 1961. *Comp. ed.* 4. 163. *Rees's Cycl.* n. 102. *Ait. Hort. Kew. ed.* 2. v. 5. 361. *Forst. Tonbr.* 110.

On moist heathy or sandy ground.

On Putney heath; in a wood by West Wickham; and at Addington, near Croydon. *Dillenius*. Upon Portland heath near Norwich. *Mr. Crowe*, and *Mr. E. Forster*.

β. At East Winch, and in Wrongay fen, Norfolk. *Mr. Crowe*.

Shrub. *May*.

A low creeping *shrub*, with long, straight, densely leafy, recumbent, or somewhat ascending, round, downy *branches*; silky when young. *Leaves* elliptical, narrower and far less silky, than the last. *Stipulas* ovate, convex, revolute, silky, occasionally notched, but often entire; sometimes small, lanceolate, and acute, on different twigs of the same plant. *Catkins* before the leaves, lateral, sessile, with 2 or 3 small *bracteas*; the barren ones short, ovate, dense, with obovate, bearded, brown-edged *scales*, half the length of their 2 capillary *stamens*; fertile rather larger, and subsequently more oblong, with several small, ovate, acute *bracteas*; their *scales* longer, brown in the upper half. *Nect.* in both, thick, ovate, abrupt. *Germ.* ovate-lanceolate, silky, often partially denudated as it ripens; its *stalk* silky, nearly or quite equal to the *scale* in length, at least by the time of perfecting *seed*. *Style* short. *Stigm.* thick, cloven.

At the persuasion of Mr. E. Forster, I have thought proper to reduce to one species, two plants that have long been cultivated, and considered by the late Mr. Crowe and myself, as very distinct. The β is smaller in every part than the other more common kind; the *branches* more recumbent; and the *leaves* shorter.

They are, however, well-marked varieties, variable in their *stipulas*, and in the margins of their *leaves* being more or less perfectly entire. They are both distinguishable from every other Willow, known to me, by a most nauseous scent, like that of some fresh-water fish, or certain aquatic herbs, or Sponges. This odour becomes powerfully offensive, when fresh specimens have been confined for 2 or 3 days in a tin box. Neither of the original names being very suitable, nor either of them applicable to both varieties, I have preferred one which, though not admissible into an essential character, will ever readily assist in determining the *S. fetida* from all its allies.

43. *S. repens*. Common Dwarf Willow.

Leaves elliptic-lanceolate, straight, somewhat pointed, nearly entire; almost naked above; glaucous and silky beneath. Stipulas none. Stem depressed, with short upright branches. Germen stalked, ovate, downy. Capsules smooth.

S. repens. Linn. *Sp. Pl.* 1447. Willd. v. 4. 693. Fl. Br. 1061. Engl. Bot. v. 3. t. 183. Rees's *Cycl.* n. 100.

S. depressa. Hoffm. *Sal.* v. 1. 63. t. 15, 16. Sibth. 16.

S. n. 1644. Hall. *Hist.* v. 2. 307; according to the son of the author.

S. pumila angustifolia, pronâ parte cinereâ. Raii *Syn.* 447; with doubtful synonyms.

S. humilis repens. Lob. *Ik.* v. 2. 138. f; good. Ger. *Em.* 1391. f. same as that of *Clusius*.

S. pumila angustifolia secunda. Clus. *Hist.* v. 1. 86. f.

On sandy mountainous heaths, where the ground is rather moist, very common.

Shrub. May.

Stem woody, depressed, often creeping, sending up numerous upright *branches*, about a finger's length, sometimes subdivided and spreading, sometimes procumbent and moderately elongated; all round and smooth, except the small leafy *shoots* of the present year, which are downy. *Leaves* small, from $\frac{1}{4}$ to $\frac{3}{4}$ of an inch long, elliptical, or broadly lanceolate, somewhat revolute, nearly or quite entire, veiny, bluntish, with a minute straight point; the upper surface dark-green, smooth; under glaucous, densely silky when young. *Footstalks* short and broad, frequently downy. *Stipulas* none. *Catkins* before the leaves, numerous, scattered, short, sessile, or nearly so, erect, with a few small ovate *bracteas*, most plentiful under the fertile ones; which are rather larger than the others, and finally almost an inch long. *Scales* of both obovate, brown, fringed or slightly hairy, deciduous. *Nect.* a green oblong gland. *Stam.* 2, smooth,

distinct, twice the length of their scale. *Germ.* ovate, downy, stalked. *Style* shorter than the thick divided *stigmas*. *Caps.* elongated and tapering, finally smooth, brown, tipped, for a while only, with the unaltered *style* and *stigmas*; its *stalk* elongated, so as to equal the scale, but still always more or less downy.

The long-stalked, very downy, bluntish *germen*, and short *style*, contrasted with the sessile *germen* of *S. fusca* tapering into a longish *style*, clearly distinguish these two very similar species, which have often too heedlessly been confounded. A wrong fertile plant, sent for *S. fusca*, gave rise to an erroneous description in *Fl. Brit.* corrected in *Engl. Bot.* 1960.

44. *S. fusca*. Brownish Dwarf Willow.

Leaves elliptic-oblong, acute, straight, flat, with a few glandular teeth; glaucous and silky beneath. Stipulas none. Stem erect, much branched. *Germen* sessile, nearly smooth, tapering into an elongated style.

S. fusca. Linn. *Sp. Pl.* 1447. *Fl. Suec. ed.* 2. 351. *Fl. Lapp. ed.* 2. 299. *t. 8. f. r*; omitting the *syn.* of Ray. Willd. *v.* 4. 694. *Fl. Br.* 1060. *Engl. Bot. v.* 28. *t.* 1960. Hoffm. *Sal. v.* 2. 14. *t.* 28, 29. Wulf. in Jacq. *Coll. v.* 2. 200; but not Jacq. *Fl. Austr. t.* 409.

S. humilis alpina, Myrti Tarentini folio. Rudb. in *Act. Suec.* 1720. 100.

On moist mountainous heaths in the north.

Shrub. May.

Stem bushy, erect, copiously branched, densely leafy, from 6 to 12 inches high; the branches spreading, brown; downy, with fine close hairs, when young. *Footstalks* longer and more slender than in the last, though dilated at the base. *Leaves* an inch, more or less, in length, elliptic-oblong, straight and nearly flat, rather acute, not revolute, the margin quite entire, though beset with distant glandular teeth, most conspicuous in the older ones; upper side dark green, nearly or quite smooth; under glaucous, and, till the leaves are far advanced, silky, with close dense hairs; both sides reticulated with veins. *Buds* large, ovate, downy, red and shining. The whole of the *foliage* becomes blackish when dried. *Catkins* generally before the leaves, numerous, on short bracteated stalks, ovate, short. *Scales* dark brown, obovate, hairy. *Nect.* a brown, oblong, papillary gland. *Stam.* full twice as long as the scale. *Germ.* according to Hoffmann, who first gave a figure of it, sessile, ovate-lanceolate, dark purple, either quite smooth, or here and there a little downy, tapering at the summit into a longish *style*, with cloven *stigmas*.

Hoffmann's plant appears to be our's, except that he does not mention the glaucous backs of the leaves. *S. fusca* is totally unlike *argentea*, with which Willdenow compares it.

45. *S. prostrata*. Early Prostrate Willow.

Leaves elliptic-oblong, convex, somewhat toothed, with a curved point; glaucous, silky and veiny beneath. *Stipulas* minute. Stem prostrate, with elongated, straight branches. Germen stalked, ovate, silky. Style shorter than the stigmas.

S. prostrata. *Fl. Br.* 1060. *Engl. Bot.* v. 28. t. 1959. *Rees's Cycl.* n. 105. *Willd. Sp. Pl.* v. 4. 695.

S. polymorpha. *Ehrh. Arb.* 49.

On heaths and commons, in various parts of Britain.

Brought from Scotland by *Mr. Dickson*. In Epping forest. *Mr. E. Forster*. On Porland heath, near Norwich. *Mr. Crowe*.

Shrub. *March, April*.

Root woody, rather long and slender. The stems compose an entangled mat, several feet in diameter, with straight, slender, round, leafy, tough, downy or silky branches, a foot or more in length, spreading close to the ground in every direction, with a few short upright ones occasionally. Leaves elliptic-oblong, numerous, scattered, on short and rather thick stalks, ascending, an inch long, convex but scarcely revolute, partly entire, partly toothed; the point recurved, or twisted; the upper side dark green, obscurely downy, veiny; under concave, glaucous, rugged with prominent veins, and silky, especially while young. *Stipulas* acute, rare and small, sometimes mere glandular points. Buds rather small and pointed. Catkins ranged numerous along the naked branches, before the leaves appear, almost sessile, each with a few small, acute, silky bracteas; barren ones ovate, sulphur-coloured, half an inch long; fertile somewhat longer, and more cylindrical. Scales of both obovate, densely bearded. Nect. cylindrical. Stam. thrice the length of their scale. Germ. on a shortish, silky stalk, ovate, rather tapering, densely silky. Style short, not so long as the cloven, obtuse stigmas. I have not seen ripe capsules.

This appears to be a very common *Salix*, often confounded with the totally distinct, not less common, *S. repens*, to which latter Willdenow refers Ehrhart's *polymorpha*. Nevertheless, I am now more confirmed in considering the specimens of this latter as answering to my *prostrata*. By the name it should seem that he jumbled various things together under his *polymorpha*, and Hoffmann may have seen some specimens of *repens*, in Ehrhart's collection of trees and shrubs. Mr. Crowe at one time took *S. prostrata* for *repens*, and observed its flowering regularly three weeks earlier than either variety of the *fætida*, along with which he cultivated it for many years. To that species it is most allied, nor is it easy to define their distinctive characters. The peculiar scent of the latter, its rounder leaves, and stouter, more ascend-

ing, *branches*, are ready off-hand marks, and the *stalk* of its *germen* is longer.

There is a mistake in *Engl. Bot.* as to the time of flowering of *S. prostrata*.

46. *S. incubacea*. Trailing Silky Willow.

Leaves elliptic-lanceolate, pointed, straight, nearly entire; convex and smooth above, with prominent reticulated veins; glaucous and silky beneath. Stem recumbent. Catkins ovate-oblong. Stalks of the silky germens longer than the scales. Capsules smooth.

S. incubacea. *Linn. Sp. Pl.* 1447. *Fl. Suec. ed.* 2. 351. *Willd. v.* 4. 696.

S. angustifolia. *Wulf. in Jacq. Coll. v.* 3. 48.

S. pumila angustifolia prima. *Clus. Hist. v.* 1. 85. *f.* 86.

S. pumila angustifolia, pronâ parte cinereâ. *Bauh. Hist. v.* 1. *p.* 2. 213. *f.* 214.

S. pumila altera. *Dod. Pempt.* 844. *f.*

Chamæitea, sive Salix pumila. *Ger. Em.* 1391. *f.*

In sandy meadows, especially near the sea.

At Hopton, Suffolk. *Mr. E. Forster*.

Shrub. *May*.

Root woody, long and creeping. *Stems* reclining or prostrate, about 2 feet in length, round, dark brown, sending off numerous crowded *branches*, mostly towards the end of each principal one, which are copiously leafy, downy, or partly silky, accompanied by short flowering shoots, intermixed or alternate with them. *Leaves* on shortish downy stalks, elliptic-lanceolate, very various in breadth, from 1 inch to $1\frac{1}{2}$ long, slightly revolute and somewhat pointed, either quite entire, or here and there notched; the upper side convex, dark green, at first minutely downy with close hairs, but soon becoming very smooth and polished, remarkable for its prominent veins, which meet towards the margin in strong, rectangular network, much more conspicuous than in any other of this tribe, and common to all the varieties, however different in length or breadth of leaf; the under side is concave, glaucous, very silky at an early period, finally nearly smooth, the midrib chiefly prominent. *Stipulas* small, ovate, acute, rarely present. *Catkins* earlier than the foliage, lateral, either sessile, or on short bracteated stalks, ovate-oblong, or shortly cylindrical. *Scales* small, obovate, blackish, bearded. *Germ.* on a silky stalk, which is equal in length to the scales, or longer; ovate-lanceolate, silky, with a small slender *style*, about as long as the thick, divided, reddish *stigmas*. *Caps.* finally light brown, nearly or quite smooth.

The principal diagnostic of this species, in which all our Swiss,

German, and Linnæan specimens, however various in the size and breadth of their foliage, agree with Mr. Forster's Hopton plant, is the prominence of the transverse and marginal veins, forming a strong network, on the naked upper surface of each leaf. The common *S. repens* alone has nearly the same character; but the much greater size of the present plant, its long spreading branches, and a total difference of habit, surely must keep it distinct; yet I have it from Germany as the *repens* of Linnæus, and *depressa* of Hoffmann. The *angustifolia* of Jacquin from himself, precisely what is represented in all the wood cuts above cited, has longer narrower leaves, and shorter catkins when in seed; yet I have various Swiss specimens connecting this with our Norfolk plant, some of them altogether the same as what Linnæus has marked *incubacea*, though the latter specimen is not of Swedish growth.

Whatever this *Salix* may be, which I must at present be content to add to our *Flora*, under Mr. Forster's sanction, as *incubacea*; it has nothing to do with my *fætida*, *prostrata*, *fusca*, or *argentea*.

47. *S. Doniana*. Rusty-branched Willow.

Leaves obovate-lanceolate, partly opposite, acute, straight, slightly serrated; livid, and somewhat silky, beneath. Stem and branches erect. Catkins cylindrical. German stalked, silky, longer than the obovate, bearded scales.

Sent from Scotland, as British, by the late Mr. George Don, to the late Mr. George Anderson. *Mr. Borrer*.

Shrub. *May*.

Stem 5 or 6 feet high, with straight, wand-like, round, leafy branches, of a reddish, or rusty, brown, scarcely downy, except when very young. *Leaves* mostly alternate, but several of the lowermost pairs are opposite, all nearly upright, flat, an inch and quarter long, uniform; broadest, and most evidently serrated, in their upper part, towards the point; green, minutely veiny, and smooth, above; livid, or in some measure glaucous, as well as finely downy, or silky, beneath, with a prominent, reddish midrib, and slender veins; the silkiness less evident on the older ones. *Footstalks* stout, very broad at the base, paler than the branches. *Stipulas* none. *Catkins* before the leaves, numerous, scattered, on short lateral stalks, each accompanied by 3 or 4 elliptic-oblong, partly silky, bractees; erect, cylindrical, three quarters of an inch long, obtuse, dense, many-flowered. *Scales* obovate, partly blackish, bearded, about half the length of the germen with its stalk. *Germ.* ovate, covered, as well as the stalk, with long silky hairs. *Style* short. *Stigmas* short

and thick, undivided ; finally perhaps cloven. I have not seen the ripe *capsules*, nor the barren *catkins*.

In its form of growth, shape of the *leaves* and *catkins*, as well as in the size and particular structure of the latter, this species comes nearest perhaps to *S. purpurea*, n. 21; but the *catkins* are shorter and stouter, having about half as many *florets*, and the *leaves* are smaller, silky when young, evincing an affinity to *S. fusca*, and its allies ; on which account I have, in compliance with the opinion of my experienced friend Mr. Borrer, placed this very ambiguous, though very distinct, species, here. The nature of its pubescence undoubtedly justifies this determination, and answers to the character, however artificial, of the present section ; approaching moreover to the partly naked, partly silky, foliage of the following.

48. *S. rosmarinifolia*. Rosemary-leaved Willow.

Leaves linear-lanceolate, pointed, straight, entire ; silky beneath. Stem erect. Catkins ovate, recurved. Germs stalked, lanceolate, silky.

S. rosmarinifolia. Linn. *Sp. Pl.* 1448. *Fl. Suec. ed.* 2. 352. Willd. v. 4. 697. *Fl. Br.* 1062. *Engl. Bot.* v. 19. t. 1365. Rees's *Cycl.* n. 109. Ehrh. *Arb.* 119.

S. repens ε. Huds. 429 !

S. pumila, *rhamni secundi Clusii folio*. Dill. in *Raii Syn.* 447.

S. humilis repens angustifolia. Lob. *Ic.* v. 2. 137. f. *Bauh. Hist.* v. 1. p. 2. 214. f.

In moist sandy ground.

Found by J. Sherard. Dill. Sent by Mr. Dickson, probably from Scotland, to Mr. Crowe.

Shrub. April.

A slender upright *shrub*, 2 or 3 feet high, allied in its habit, silky silvery foliage, and short ovate *catkins*, to *S. Dicksoniana*, n. 31, and *S. Arbuscula*, n. 33 ; but much more silky, or downy, than either, and the *catkins* at first are singularly recurved. The *branches* are upright, very slender, round ; silky when young. *Leaves* scattered, on short slender stalks, nearly upright, straight, linear-lanceolate, acute, hardly ever more than $\frac{1}{4}$ of an inch broad, at most, and from 1 to 2 inches long, entire, sometimes beset with a few marginal glands ; the upper surface silky when young, but soon becoming smooth and veiny, of a rather light green, scarcely blackened in drying ; under glaucous, and at every period more or less silky. *Stipulas*, if present, rather large, erect, ovate, oblique, silky, rarely divided. *Catkins* lateral, nearly sessile, with 2 or 3 linear *bracteas*, densely silky at the back ; at first drooping, ovate, and very short ; as they advance becoming more erect, but still short and thick. *Scales* small,

ovate, or obovate, blackish, bearded. *Nect.* ovate, black-edged. *Germ.* ovate-lanceolate, tapering, densely silky, on a downy stalk half as long as the scale. *Style* thick and short. *Stigmas* broad, subsequently cloven to the base, dark brown or purplish. The barren *catkins* I have not met with; but in a somewhat allied American species they are, like the fertile ones, short, ovate, and recurved.

The *Rhamnus secundus* of Clusius, to which this Willow is compared by Dillenius, is *Hippophæe rhamnoides*. It hardly less resembles that plant than it does *S. repens*, or any of the same tribe.

49. *S. cinerea*. Grey Sallow.

Stem erect. Lower leaves entire; upper serrated, obovate-lanceolate; glaucous, downy, and reticulated with veins, beneath. Stipulas half-heartshaped, serrated. Germen silky; its stalk half as long as the lanceolate scales.

S. cinerea. Linn. *Sp. Pl.* 1449. *Fl. Suec. ed.* 2. 353. *Fl. Lapp. ed.* 2. 296; omitting the reference to Villars. Willd. v. 4. 690. *Fl. Br.* 1063. *Engl. Bot. v.* 27. t. 1897. *Rees's Cycl. n.* 94. *Forst. Tonbr.* 111.

S. acuminata. Hoffm. *Sal. v.* 1. 39. t. 6. f. 1, 2. t. 22. f. 2. Ehrh. *Arb.* 89?

S. daphnoides. Villars *Dauph. v.* 3. 765. t. 50. f. 7; bad. From the author.

In moist marshy woods and hedges, in various parts of England.

In Cumberland, and in Fream wood. *Rev. Mr. Lightfoot*. In the grounds of Lord Viscount Anson, at Shugborough, Staffordshire; also in Gloucestershire, between Bristol and the Severn; and doubtless in many other places.

Tree. *April*.

Twenty or thirty feet high, if left to its natural growth; in hedges or thickets more dwarf and bushy. It is readily to be distinguished from other common Willows by a rusty glittering hue, residing more perhaps in the fine veins, than in the pubescence sprinkled over them, which consists of minute, prominent, shining hairs, totally unlike the depressed silkiness of the tribe we have just been investigating. The rusty colour indeed increases after the specimens have been long dried, but is visible, in some degree, in the growing plant, especially towards autumn. The branches are smooth, reddish-brown, crooked; the young ones slender, spreading, and, in an early state, downy. When the tree has been much cut, it of course sends forth strong flowering, and afterwards leafy, shoots, as represented in *Engl. Bot.* On the leafy branches of the year the lower leaves are nearly or quite entire, an inch, or inch and half, long, obovate, with a short oblique point, on shortish, slender footstalks, without stipulas; the upper ones twice as large, variously serrated, with half-

heartshaped *stipulas*, strongly serrated or toothed, various in size, never very large. All the *leaves* are of a firm texture, soft to the touch; deep green and veiny, though not rugged, above; glaucous, more downy and soft, beneath, with numerous, prominent, pale or reddish *veins*, of which the transverse ones are parallel, though curved, their subordinate divisions straight, numerous, elegantly parallel, interbranching towards the margin. *Catkins* before the leaves, numerous, nearly sessile, an inch long, thick, obtuse, downy, with very small, silky, oblong *bracteas*. *Scales* lanceolate, acute, dark brown, pale at the base, plentifully bearded and clothed with long silky hairs. *Nect.* a single oblong gland. *Stam.* 2, slender, yellow, smooth, quite distinct, twice as long as the scale. *Germ.* lanceolate, somewhat ovate at the base, silky all over, its silky stalk half the length of the scale. *Style* short and thick. *Stigmas* rather longer, deeply cloven.

A very curious specimen, gathered at Duckinfield, near Stockport, Cheshire, by Mr. Robert Gee, bears a monoecious *catkin*, the lower half of which consists of perfect *germens*, with their *styles* and *stigmas*; the upper of a few misshapen bodies, with apparently perfect *stamens* at the top. This and another instance or two of the same kind, render the report of Willows changing their *flowers*, from one sort to another, though scouted by Linnaeus in his *Gen. Pl.*, not altogether incredible.

S. cinerea is perhaps one of the most useless of the Sallow tribe, which it here introduces. They are known by their obovate, or rounded, downy *leaves*, and thick, early, silky *catkins*, with prominent, yellow, distinct *stamens*, two in each *floret*. Hoffmann's *acuminata* is certainly this plant, and not what I have all along so named. See n. 60. I have a morsel with variegated *leaves* from Germany.

50. *S. aurita*. Round-eared, or Trailing, Sallow.

Branches trailing. Leaves somewhat serrated, convex, obovate, obtuse, with a small hooked point; hairy, and reticulated with veins, on both sides. *Stipulas* roundish, convex, toothed. *Germen* silky, stalked. *Stigmas* nearly sessile.

S. aurita. Linn. *Sp. Pl.* 1446. *Fl. Lapp. ed.* 2. 303. *t.* 8. *f.* y. *Fl. Br.* 1064. *Engl. Bot.* v. 21. *t.* 1487. *Forst. Tonbr.* 111. *Hook. Scot.* 285. *Ehrh. Arb.* 39. *Hoffm. Sal.* v. 1. 30. *t.* 4. *f.* 1, 2. *t.* 22. *f.* 1.

S. caprea δ . *Huds.* 430.

S. uliginosa. *Willd. Enum.* 1007.

S. ulmifolia. *Villars Dauph.* v. 3. 776. *t.* 51. *f.* 20.

S. n. 1652. *Hall. Hist.* v. 2. 310.

S. folio rotundo minore. *Dill. in Raii Syn.* 450. *Giss.* 38. *append.* 37.

β . *S. caprea pumila*, folio subrotundo, subtùs incano. *Dill. in Raii Syn.* 450.

S. aurita. *Willd. Sp. Pl. v.* 4. 700; *excluding the specific char. Enum.* 1007.

In moist upland woods and thickets.

β . In low wet pastures.

Shrub. *April, May.*

Stem bushy, usually 3 or 4 feet high; in the variety β scarcely a foot. *Branches* spreading or trailing, either amongst other bushes, or on the ground, to a great extent, whence the name of Trailing Sallow by which it is known in Norfolk; they are roundish, brown, hoary; rather angular, purplish, and downy, as well as leafy, when young. *Leaves* various in size, on short, stout, downy *footstalks*, obovate, generally an inch or two long, more or less contracted toward the base, though sometimes rounded, or nearly ovate, in that part; their termination is often remarkably obtuse, or abrupt, with a broad, short, recurved, hooked, or oblique, point; both sides hairy and very rugged; the uppermost dark green, wrinkled like a cabbage leaf; under side paler, rather glaucous, more hairy or downy, and strongly veined; the margin in some measure revolute, coarsely serrated and crisped. The earliest *leaves*, appearing soon after the blossoms, are but $\frac{1}{2}$ or $\frac{3}{4}$ of an inch long, abrupt and entire; very densely downy beneath; similar to which, though partly serrated and less hoary, is the whole foliage of the variety β . *Stipulas* half-heartshaped, or rounded, convex, strongly veined and toothed, as well as wrinkled; glaucous and vaulted beneath; very various in size, but never wholly absent. *Catkins* before the leaves, nearly or quite sessile, elliptic-oblong, with very small, lanceolate, hairy *bracteas*; barren ones not an inch long at most; fertile longer, especially as they advance in age. *Scales* oblong-lanceolate, or narrowly obovate, thin, bearded, whitish with a brown tip, soon withering. *Nect.* a tumid, abrupt, yellowish gland. *Stam.* twice the length of their scale. *Germ.* on a hairy stalk, which is hardly equal to the scale; ovate, or, when fully formed, more lanceolate and tapering, all over downy, or silky. *Style* scarcely any. *Stigmas* ovate, thick, finally notched. The *leaves* occasionally form permanent rosaceous tufts, like those of *S. Helix*, *n.* 22.

There are some gradations between the common appearance of this *Salix*, and its ultimate very small-leaved variety β ; but, on the other hand, I scarcely think Dillenius correct in saying there were "some pretty tall trees of it in hedges near Chisselhurst." These must rather have been the *cinerea*, or the *aquatica*. Botanists, even the most attentive, have confounded both these species occasionally with the present, and have gone so far as to suppose them all varieties of *S. caprea*.

I have received, by favour of Mr. H. Potter, two specimens of β ,

analogous to that mentioned under *S. cinerea*, bearing *catkins* composed of *pistils* in their lower half, and *stamens* in the upper; above which, on one *branch*, are 2 entirely of barren *florets*. These grew on a dry declivity in a wood, likewise at Duckinfield. Their *leaves* clearly determine them to be the dwarf *aurita*, and coming from the same place, it may be suspected that the former specimen, which has no *leaves*, is the same. This must remain doubtful. The *branch* most resembles *cinerea*, and the parts of fructification are too much alike in both, to assist in the decision between two such dried specimens. It appears that the following is subject to a similar deformity.

51. *S. aquatica*. Water Sallow:

Stem and branches erect. Leaves slightly serrated, obovate-elliptical, minutely downy, flat; rather glaucous beneath. Stipulas rounded, toothed. Germen silky, stalked. Stigmas nearly sessile.

S. aquatica. *Fl. Br.* 1065. *Engl. Bot.* v. 20. t. 1437. *Rees's Cycl.* n. 118. *Willd. Sp. Pl.* v. 4. 701. *Forst. Tonbr.* 111.

S. Caprea α. *Huds.* 429.

S. cinerea. *With.* 54. *Hull* 219. *Relh.* 387.

S. n. 1651. *Hall. Hist.* v. 2. 310? This, as the son of the author informed Mr. Davall, comprehends several distinct species. Among them perhaps, by the description of the *Catkins*, is our following one.

S. aurita. *Hoffm. Sal.* t. 5. f. 3.

S. Timmii. *Schkuhr*; according to *Prof. Mertens*.

S. folio ex rotunditate acuminato. *Raii Syn.* 149.

S. folio ex rotundo acuminato auriculata. *Raii Cant.* 145.

S. caprea rotundifolia. *Ger. Em.* 1390. f. *Tabern. Kreuterb.* 1492. same f.

In wet hedge-rows, woods, swamps, and the banks of ponds or rivers, extremely common.

Shrub, or small Tree. *April*.

Stem generally bushy, rarely forming a tree. *Branches* numerous, upright; the young ones slender, hoary, or finely downy, leafy throughout, often angular. *Leaves* on rather slender downy *footstalks*, elliptic-oblong, acute, about 2 inches in length, flat, not wavy, though serrated about the middle and towards the extremity; narrowest at the base; the lower ones on each branch gradually smaller, quite entire, obovate, rounded and obtuse, the lowest of all not half an inch long; all soft and pliant, of a dull greyish green, reticulated with minute veins; not rugged, but even, and finally smooth, on the upper side; glaucous and minutely downy, underneath. *Stipulas* rounded, vaulted, toothed, smaller than the last. *Catkins* before the leaves, sessile, numerous, elliptic-oblong. *Bracteus* lanceolate, hairy, very

small. *Scales* obovate, dark brown in their upper half at least, externally hairy. *Nect.* oblong. *Stam.* twice as long as their scale. *Germ.* ovate-lanceolate, silky; its stalk somewhat hairy, shorter than the scale. *Style* very short. *Stigmas* thick, ovate, undivided. *Caps.* light brown, silky, with long tapering valves.

A very common species, brittle, not of any particular use but as fire-wood, most related to the last, but distinct in mode of growth as well as foliage. The *catkins* too are twice as large, more like those of *cinerea*; but much smaller than *oleifolia* or *caprea*, both totally different from this, and well distinguished from it by that circumstance alone.

Mr. Dillwyn and Mr. J. Woods found, near London, on a plant of this species, some deformed *catkins*, analogous to those mentioned under the two foregoing.

52. *S. oleifolia*. Olive-leaved Sallow.

Stem erect. Branches straight, spreading. Leaves obovate-lanceolate, flat, rather rigid, minutely toothed, acute; glaucous, reticulated, and finely hairy, beneath. *Stipulas* small, notched, rounded. *Catkins* oval, nearly half as broad as long.

S. oleifolia. *Fl. Br.* 1065. *Engl. Bot.* v. 20. t. 1402. *Rees's Cycl.* n. 119. *Willd. Sp. Pl.* v. 4. 702. *Forst. Tonbr.* 111.

S. n. 1651. *Hall. Hist.* v. 2. 310? at least one of his supposed varieties.

In woods and hedges.

Very abundant in the hedges and copses about Tittleshall and Litcham, also in the parish of Framingham, Norfolk, as well as in other parts of England. Mr. T. F. Forster found it in wet hedges and fields about Tonbridge.

Tree. *March*.

Truly arboreous, and, if allowed to grow, as tall as a common Crab-tree, though not of so stout a habit as the *Salix caprea*, the *catkins* excepted. The *branches* are round, when young somewhat angular, brown, more or less hoary with short down, very soft to the touch. They are leafy in the upper part, and in the lower beset with *flower-buds*, at first small, for the following spring. These *buds* increase to a very large size before they open, so that this Willow, like *S. caprea*, may be known by its great *buds*, while stripped of its foliage. The *leaves* spread but moderately, and are from 2 to near 3 inches in length, 1 at most in breadth, elliptic-lanceolate, tapering at each end, somewhat obovate, acute, not pointed; at first sight seeming entire, or minutely serrated; but they are more generally bordered with minute glandular teeth; the upper side green, flat, even, obscurely hoary rather than downy; under paler, slightly glaucous, with copious, prominent, reticulated, minutely hairy, veins,

acquiring by time a portion of the rusty hue of *S. cinerea*. Their substance is firm, rather coriaceous ; and in their earlier state they are densely downy. *Footstalks* rather short, downy. *Stipulas* either wanting, or small, never large ; when most conspicuous they are recurved, or vaulted, often cloven. *Catkins* remarkably large, thick, sessile, with a very few, peculiarly small, hairy *bracteas* ; their shape an oblong oval ; their length an inch or more ; their diameter, including the *stamens*, above half as much. *Scales* obovate-oblong, half blackish, hairy. *Nect.* obtuse. *Stam.* much longer than the scale, with large golden *anthers*.

Mr. Borrer has communicated, from Sussex, a truly wonderful monstrosity, observed by him for several successive years, in which several of the upper *catkins*, on some branches of this species, gradually change their nature. First the *stamens* of each *floret* are formed, more or less, combined, some entirely so, an apparently simple *filament* bearing 2 *anthers*. Further down there are *catkins* whose lower part consists of shapeless oblong smooth bodies, resembling *germens*, tipped with two simple minute horns, as if the *anthers* were replaced by imperfect *stigmas* ; and there are one or two rudiments of more complete, somewhat silky, *germens*, with 2 sessile undivided *stigmas*. Their precise nature cannot be ascertained, without mutilating this very curious specimen. The real fertile *catkins* I have not examined ; but it is to be presumed their *pistils* do not much differ from the rest of the Sallow tribe, all very nearly resembling each other in those organs. The specimen here described invalidates an opinion advanced in my *Introduction to Botany*, ed. 1. 276, ed. 5. 220, that “ *stamens* and *pistils* never change into each other.” The intelligent botanist will make his own observations, and may perhaps trace the progress of so strange a metamorphosis.

53. *S. cotinifolia*. Quince-leaved Sallow.

Stem erect. Branches spreading, downy. Leaves broadly elliptical, nearly orbicular, slightly toothed ; glaucous and downy, with rectangular veins, beneath. Style as long as the linear notched stigmas.

S. cotinifolia. *Fl. Br.* 1066. *Engl. Bot.* v. 20. t. 1403. *Rees's Cycl.* n. 120. *Willd. Sp. Pl.* v. 4. 702. *Hook. Scot.* 286.

S. spadicea. *Villars Dauph.* v. 3. 777. *From the author.*

In thickets and woods.

Sent from Scotland by Mr. Dickson to Mr. Crowe, who found it himself, in some of the upland parts of Norfolk. “ By the roadside between Newton Stewart and Glenluce, Wigtonshire ; Mr. Maughan ; on the banks of the Esk, near Forfar, but rare ; Mr. G. Don ;” *Hooker*.

Shrub. *April*.

About 2 feet high ; sometimes, if sheltered, 6 or 8 feet, always upright, with straight, round, brown, downy, moderately spreading, *branches*. *Leaves* an inch, or inch and half long, and an inch wide, flat, broadly elliptical, frequently almost orbicular, with a broad short point ; the base rounded, or obtuse ; the margin beset with very shallow serratures, or more generally with small glandular teeth ; upper side dull green, covered with minute, depressed, scattered hairs ; under pale, or slightly glaucous, more loosely hairy, especially the rib, and transverse parallel veins, whose subdivisions compose a fine rectangular network. The substance of the *leaves* is firm and rigid, and their aspect resembles a Quince leaf, or rather perhaps *Rhus Cotinus*, except the latter being of a brighter green, and smooth. They blacken in drying, though less than the following. *Foot-stalks* stout, downy. *Stipulas* small, rounded, or ovate, withering. *Buds* hairy. *Catkins* much earlier than the foliage, sessile, erect, cylindrical, short and obtuse, scarcely one fourth the size of the foregoing, with 2 or 3 small shaggy *bracteas*. *Scales* obovate, broad and rounded, blackish, bearded with long hairs. *Nect.* small and blunt. *Germ.* ovate-lanceolate, silky, on a partly downy stalk, which is shorter than the scale. *Style* thick, smooth, longer than is usual in the Sallow tribe, being equal to the linear, obtuse, notched *stigmas*. *Caps.* tapering, brown, nearly smooth.

Villars supposes this may be an " intermediate variety " between the *hastata* and *lanata* of Linnæus ; but it is impossible to make out what he intends by the latter, except that it is not the true one, nor could his *spadicea* have been ascertained but by a specimen from himself. It is precisely our *cotinifolia*, which name I retain, as far preferable in itself, and nearly of the same date ; *spadicea* does not in any sense apply. No species can be more clearly distinct.

54. *S. hirta*. Hairy-branched Sallow.

Stem erect. Branches densely hairy. Leaves elliptic-heartshaped, pointed, finely crenate ; downy on both sides. Stipulas half-heartshaped, flat, toothed, nearly smooth.

S. hirta. *Engl. Bot.* v. 20. t. 1404. *Comp. ed.* 4. 164. *Rees's Cycl.* n. 121. *Willd. Sp. Pl.* v. 4. 696.

In woods and hedges.

Found in Norfolk, by *Mr. Crowe*.

Tree. *April, May*.

A small *tree*, remarkable for its thick, round, hoary *branches*, clothed very densely with prominent, close, horizontal, soft,

cottony hairs, which retain all their whiteness when the green parts turn black, and this soon happens in drying. *Leaves* elliptic-oblong, a little heart-shaped, or cut away, at the base, from 2 to 3 inches in length, and at least one in breadth, sharp-pointed, flat; bordered with shallow serratures, or blunt notches; the upper surface of a dull green, minutely hairy; under pale or glaucous, more densely downy, particularly the rib and veins, which last are reticulated like the foregoing. *Footstalks* stout, densely downy, half an inch long. *Stipulas* large, half-heart-shaped, acute, wavy and partly toothed, veiny, green, almost entirely smooth, contrasted remarkably with the white down of the adjoining branch and footstalks, which constitutes a striking character of the species. *Catkins* nearly sessile, cylindrical, an inch or more in length, with small hairy *bracteas*. *Scales* blackish, bearded with long hairs, obovate; the lower ones often tapering to a point. *Nect.* roundish, papillary. *Stam.* swelling upwards, twice as long as the scale. *Anth.* large, yellow.

55. *S. rupestris*. Silky Rock Sallow.

Stem trailing. Leaves obovate, acute, serrated, flat, even, silky on both sides. *Stipulas* hairy. Branches minutely downy. Germen stalked, awl-shaped, silky. Style as long as the blunt undivided stigmas.

S. rupestris. *Donn Cant. ed.* 5. 231. *Engl. Bot. v.* 33. *t.* 2342. *Comp. ed.* 4. 163. *Rees's Cycl. n.* 123. *Hook. Scot.* 285.

On rocks in the Highlands of Scotland.

Discovered in the Highlands, by the late *Mr. George Anderson*. On the rocks of Craig Challoch and Mael Ghyrdy. *Mr. W. Borrer*. Near Blanchland, Northumberland. *Mr. Winch*.

Shrub. *May*.

Stems trailing, or depressed, with dark-coloured branches, very finely downy when young. *Leaves* about an inch long, obovate, or elliptical, acute, even and flat, veiny, but not wrinkled, finely and regularly serrated, beautifully silky with depressed hairs, more especially beneath, and when young. *Footstalks* downy in the manner of the branches. *Stipulas* ovate, very minute, externally hairy, often wanting. *Buds* small, bristly. *Catkins* rather before the leaves, sessile, ovate, thick, half an inch long; the fertile ones soon becoming thrice that length, and more lax; the *bracteas* of all oblong, smooth above, very silky at the back. *Scales* blackish, obovate, more or less bluntly pointed, bearded with long hairs. *Nect.* papillary. *Stam.* twice the length of the scale, capillary, with ovate yellow *anthers*. *Germ.* on a longish hairy stalk, ovate-awlshaped, clothed with silky hairs, and projecting far beyond the scales. *Style* smooth, twice or thrice as long as the blunt undivided stigmas.

By no means a dwarf variety of *S. cinerea*, *aquatica*, *aurita*, or, still less, *oleifolia*! It is needless to repeat their differences, or to show the total dissimilarity of the present, any more than of the following species.

56. *S. Andersoniana*. Green Mountain Sallow.

Stem upright. Leaves elliptical, acute, finely notched, slightly downy; paler beneath. Stipulas half-ovate, nearly smooth. Branches minutely downy. Germen smooth; its stalk almost equal to the scale. Style cloven, longer than the cloven stigmas.

S. Andersoniana. *Engl. Bot. v. 33. t. 2343. Comp. ed. 4. 163. Rees's Cycl. n. 123. Hook. Scot. 285. Winch Geogr. Distrib. ed. 2. 34; from the author.*

In woods, and on the banks of rivers, in Scotland and the north of England.

Brought from Breadalbane, where Dr. Walker first found it, by the late *Mr. George Anderson*. At Heaton Dene, and upon the banks of the Tyne, below Newcastle. *Mr. Winch*.

Shrub. *April, May*.

Stem bushy, its *branches* green the first summer, afterwards of a sooty brown, are clothed with dense, short, curved down, finally disappearing from the older ones. *Leaves* of a rich bright green, blackish when dried, an inch or inch and half long, broadly elliptical, acute, scarcely pointed, flat, finely crenate, or copiously and bluntly serrated; paler, but not glaucous, underneath; more or less downy on both sides, especially the midrib and veins, with minute hairs; their substance thin and pliant; the very young ones silky. *Footstalks* downy, rather short. *Stipulas* small, half-ovate, toothed, slightly downy, erect and flat; after a while recurved and vaulted. Fertile *catkins* somewhat stalked, short, ovate, coming before the leaves, subsequently elongated and cylindrical. *Bracteas* ovate, minutely crenate, more than half as long as the catkins; smooth above; sparingly silky beneath. *Scales* obovate, all over blackish, bearded. *Nect.* cylindrical, abrupt, papillary. *Germ.* ovate-lanceolate, green, quite smooth and naked, its stalk smooth, nearly equal in length to the scale. *Style* stout, awl-shaped, smooth, cloven at the summit, longer than the thick, obtuse, likewise cloven, *stigmas*. *Catkin* of ripe *capsules* not above an inch long.

The smooth *germen* distinguishes this from every other known species of the Sallow tribe; to which its pubescence, *stipulas*, and the structure, as well as proportion, of the parts of fructification, demonstrate its affinity. We know not of its being put to any use.

57. *S. Forsteriana*. Glaucous Mountain Sallow.

Stem erect. Branches minutely downy. Leaves elliptic-ovate, acute, crenate, slightly downy; glaucous beneath. Stipulas vaulted. Germen stalked, awl-shaped, silky. Style as long as the blunt notched stigmas.

S. Forsteriana. *Engl. Bot.* v. 33. t. 2344. *Comp. ed.* 4. 164. *Rees's Cycl.* n. 124. *Hook. Scot.* 285. *Winch Geogr. Distrib. ed.* 2. 34.

In woods, and on the banks of rivers, in Scotland and the north of England.

Not rare in Scotland. *Mr. Forster*. In Heaton Dene, and on the banks of the Tyne, near Frier's Goose. *Mr. Winch*.

Shrub, or small Tree. *May*.

Taller than the last species, forming a small *tree*, with finely downy branches. *Leaves* larger and firmer than those of *S. Andersoniana*; their upper surface of a darker or duller green, though more polished, scarcely downy, except the midrib and veins; under glaucous, finely veiny, with more downiness; their length 2 or 3 inches; the margin crenate, rather than serrated; the young ones are very densely silky, in the manner of the foregoing. *Footstalks* downy. *Stipulas* rounded, recurved and vaulted, toothed, in some degree hairy. Fertile *catkins* an inch long when in full bloom, more than twice as much when the *seeds* are ripe, cylindrical, many-flowered, each on a shortish hairy stalk, with a couple of stalked, ovate, crenate *bracteas*, moderately silky at the back, the size of the last-described. *Scales* partly blackish, hairy, obovate; the lower ones acute; each about the length of the hairy stalk of the tapering silky *germen*. *Nect.* papillary. *Style* about twice as long as the thick, notched, seldom divided, *stigmas*. It is represented too short in *Engl. Bot.* *Capsules* light brown, almost stripped of their pubescence.

The structure of the *flowers*, and habit of the whole plant, show this, like *S. Andersoniana*, to be a true Sallow, though the degree of its pubescence is much less than what is usual in this section of the genus. Two names more dear than these, to the memory of their friends or to Botany, can scarcely be recorded in the history of science.

58. *S. sphacelata*. Withered-pointed Sallow.

Stem erect. Leaves elliptic-ovate, even, veiny, entire, or slightly serrated; downy on both sides; discoloured at the point. Stipulas half-heartshaped, toothed, erect. Germen stalked, ovate-lanceolate, silky. Stigmas notched, longer than the style.

S. sphacelata. *Fl. Br.* 1066. *Engl. Bot.* v. 33. t. 2333. *Rees's Cycl.* n. 125. *Willd. Sp. Pl.* v. 4. 702. *Hull ed.* 2. 295. *Hook. Scot.* 286.

S. lanata. *Lightf.* 602; in *his herbarium*.

S. capreae varietas. *Hoffm. Sal. v.* 1. 28. *t.* 5. *f.* 4; excellent. *t.* 21. *f.* d?

In valleys among the Highlands of Scotland. *Lightfoot*.

At Finlarig, near the head of Loch Tay. *Rev. Dr. Stuart*.

Tree. *April, May*.

A small bushy tree, six or eight feet high, the young branches very soft, with dense, hoary, short, velvet-like down. Leaves in like manner soft and downy, especially when first opening, always of a greyish aspect; their shape obovate, or elliptical, with a small oblique point; their length an inch and half, perhaps two or two and half at their full growth; the margin either quite entire, or slightly, sparingly, and unequally serrated; the upper side light green, clothed with fine down which finally disappears; under more downy, with a prominent rib and veins, hoary, not glaucous; the tip, from its earliest formation, nearly naked, green, or brownish, soon looking as if blasted, or withered, assuming a tawny hue. This character, which struck me in the few dried specimens I had seen, is eminently conspicuous in the plentiful foliage of the living plant, which I saw for the first time, and instantly recognized, in the rich collection of Mr. E. Forster, at Hale End, in May 1825. The footstalks are shortish, thickly downy. Stipulas half-heartshaped, toothed, erect, green and smooth, never large, often wanting. Catkins on short hairy stalks, with several ovate, sessile, not large, bractees, densely silky at the back; barren ones above an inch long, cylindrical, not half the size of *S. caprea*; fertile somewhat larger and stouter, finally measuring full an inch and half. Scales of both obovate, downy and bearded, black in their upper half. Nect. oblong, abrupt, constricted in the middle. Stam. twice as long as the scale, with roundish, pale-yellow anthers. Germ. lanceolate, silky, on a hairy stalk as long as the scale. Style very short. Stigm. thick, either undivided or notched, not deeply cloven. Caps light reddish brown, somewhat silky or downy.

Mr. Lightfoot's specimen leaves no doubt of his plant, and his description appears to be original. He might well, by the figure of *S. lanata* in *Fl. Lapp.*, mistake it for that species, and yet nothing can be more distinct than the real *lanata*; see *n.* 40. Mr. Davall gathered our *sphacelata* near Orbe in Switzerland. It may be comprehended under Haller's *n.* 1651; see *S. aquatica*.

59. *S. caprea*. Great Round-leaved Sallow.

Stem erect. Leaves roundish-ovate, pointed, serrated, waved; pale and downy beneath. Stipulas somewhat crescent-shaped. Catkins oval. Germen stalked, ovate, silky. Stigmas nearly sessile, undivided. Capsules swelling.

S. caprea. *Linn. Sp. Pl.* 1448, *α.* *Willd. v.* 4. 703, (excluding VOL. IV.

- Fl. Dan.*) *Fl. Br.* 1067. *Engl. Bot.* v. 21. t. 1488. *Rees's Cycl.* n. 126. *Lightf.* 607. *Hook. Scot.* 286. *Hoffm. Sal.* t. 3. f. 1, 2. t. 21. f. a, b, e. *Ehrh. Arb.* 98.
S. n. 1653. *Hall. Hist.* v. 2. 310.
S. latifolia rotunda. *Bauh. Pin.* 474. *Raii Syn.* 449.
S. folio subrotundo, auriculata. *Raii Cant.* 145. n. 2.
S. quarta. *Trag. Hist.* 1078. f.
S. caprea latifolia. *Tabern. Kreuterb.* 1452. f. *Ger. Em.* 1390. f. fl. only.
S. latifolia infernè hirsuta. *Bauh. Hist.* v. 1. p. 2. 215. f.

In woods and hedges, on a rather dry soil, very common.

Tree. *April.*

A moderate-sized tree, with spreading, round, brown, or purplish, branches, minutely downy when young. *Leaves* larger and broader than in any other of the genus, of a deep green above, with a downy rib; white underneath, or rather glaucous, veiny, densely clothed with soft, white, cottony down, which gives them a considerable thickness; they are generally broadly ovate, approaching to orbicular, with a sharp point; sometimes more elliptical; either rounded, or slightly heart-shaped, at the base, varying in length from 2 to 3 inches; the margin wavy, and more or less strongly serrated. Willdenow describes them as almost a foot long on young trees; but I have never met with such. *Footstalks* stout, downy, approaching to an inch in length, though often much shorter. *Stipulas* very various in size, half-heartshaped, acute, serrated, ribbed, glaucous at the back, assuming a erecent shape as the branch swells. *Catkins* numerous, much earlier than the foliage, almost quite sessile; the barren ones much larger than in any other British species, *S. oleifolia* excepted, being above an inch long, thick, oval, bright yellow, fragrant after rain, which last quality is, however, not peculiar to this species; fertile ones at first of the same size and shape, but they soon become more elongated and cylindrical. *Bractes* oblong, small, conspicuous, at the first opening of the buds, for their beautiful silvery satin-like covering. *Scales* obovate, blackish, extremely hairy. *Nect.* ovate, papillary. *Stam.* longer than their scale, with oblong, full-yellow *anthers*. *Germ.* ovate-lanceolate, silky, on a hairy stalk, scarcely equal to the scale. *Style* hardly any. *Stigm.* oblong, thick, undivided. *Caps.* ovate, nearly smooth. The great *flower-buds*, before they open, are no less remarkable than in *S. oleifolia*.

The name *caprea* seems to have originated in the reputed fondness of goats for the *catkins*, as exemplified in the wooden cut of the venerable *Tragus*, their namesake.

Lightfoot well describes the various length and breadth of the *leaves*, as well as their downy softness. He speaks of the *bark* as serving the Highlanders for tanning, and of the *wood* as smooth, soft, white and flexible, used for handles of hatchets,

spades, &c, and for the cutting-boards of shoemakers. This bark has been found no bad substitute for the *Cinchona* in agues. The wood and branches make the best hurdles, being tough, flexible and durable. Their superior qualities first led Mr. Crowe to investigate the different sorts of Sallows and Willows, several totally worthless ones, like *Salix bicolor*, having been cut for use, by his labourers, indiscriminately with the present valuable species. The plentiful honey of the *catkins* attracts bees in the spring. Their yellow colour, and the brilliancy of their opening buds, enliven the country, before any other blossoms appear.

60. *S. acuminata*. Long-leaved Sallow.

Stem erect. Leaves lanceolate-oblong, pointed, wavy, finely toothed; glaucous and downy beneath. Stipulas half-ovate; then kidney-shaped. Catkins cylindrical. Germen stalked, ovate, hairy. Style as long as the undivided stigmas.

S. acuminata. *Fl. Br.* 1068; omitting the references to Miller and Hoffmann. *Engl. Bot.* v. 20. t. 1434. *Rees's Cycl.* n. 129. *Willd. Sp. Pl.* v. 4. 704. *Hook. Scot.* 286. *Forst. Tonbr.* 111.

S. caprea; a singular variety. *Lightf.* 608.

S. caprea acuto longoque folio. *Raii Syn.* 450.

S. caprea latifolia. *Ger. Em.* 1390. *f. leaves*.

In rather moist woods and hedges frequent.

Tree. *April*.

Generally of more humble growth than the foregoing, though sometimes becoming a lofty *tree*, with upright, or less spreading, *branches*, which are always minutely downy, very soft to the touch. *Leaves* of a totally different shape, commonly 3 or 4 inches long, and 1, at least, in breadth, elliptic-lanceolate, tapering to an acute point, either flat, or somewhat rugged, with copious, though shallow and unequal, marginal notches; the upper side green and smooth, except the midrib; under paler, and in a young state glaucous, delicately soft and downy, with a prominent reddish midrib and veins. *Footstalks* reddish and downy, stout, measuring full half an inch. *Stipulas* half-ovate, or half-heartshaped, acute, toothed, ribbed; glaucous at the back; subsequently curved, so as to become kidney-shaped. Fertile *catkins* cylindrical, above an inch long, somewhat stalked, with numerous, large, ovate-lanceolate, acute *bracteas*, clothed with somewhat silky down, but not silvery like those of *S. caprea*. *Scales* obovate, partly black, bearded with long hairs; the lower ones acute. *Nect.* oblong, abrupt, flattish. *Germ.* ovate, densely hairy or silky, on a hairy stalk, not above half as long as the adjoining scale. *Style*, when full grown, equal in length to the thick undivided *stigmas*.

A variety, as Mr. Crowe like myself always thought it, found in a copse of his at Tuck's wood, near Norwich, has smaller, more rugged, *leaves*; and rather smaller *catkins*; but this may arise from their different ages on my specimens. In the *germen*, its stalk, or the *style* and *stigmas*, I do not find any difference. These parts are not arrived at full maturity in the specimen delineated in *Engl. Bot.*

Prof. Mertens first convinced me that the *acuminata* of Hoffmann is not this *Salix*, but an indubitable variety of *aquatica*. The name *acuminata* may well remain with our present plant; whose qualities I believe are inferior, except possibly in the wood, to those of the *caprea*. It is certainly not *caprea* γ of Linn. *Sp. Pl.*, which proves, by an original specimen from Gmelin himself, the *serotina* of Pallas; see *Rees's Cycl.* n. 83. This latter is moreover *S. Gmeliniana* of Willdenow, *Sp. Pl.* v. 4. 709.

61. *S. viminalis*. Common Osier.

Leaves linear, inclining to lanceolate, elongated, taper-pointed, entire, wavy; snow-white and silky beneath. Branches straight and slender. Germen sessile. Style as long as the linear undivided stigmas.

S. viminalis. Linn. *Sp. Pl.* 1448. Willd. v. 4. 706. Fl. Br. 1070. *Engl. Bot.* v. 27. t. 1898. *Rees's Cycl.* n. 134. Hook. Scot. 287. Hoffm. *Sal.* v. 1. 22. t. 2. f. 1, 2. t. 5. f. 2. t. 21. f. 2, e, f, g. Ehrh. *Arb.* 69. *Beitr.* v. 6. 102.

S. n. 1641. Hall. *Hist.* v. 2. 307.

S. folio longissimo. Raii *Syn.* 450. Cant. 146.

S. angustis et longissimis foliis crispis, subtus albicantibus. Bauh. *Hist.* v. 1. p. 2. 212. f.

S. aquatica. Ger. *Em.* 1389. n. 2. f. bad.

Elæagnus. Dalech. *Hist.* 278. f.

In wet meadows, osier-holts, and on the banks of rivers, common. Tree. April, May.

Branches straight, erect, wand-like, very long and slender, round, polished; downy when young, with fine silky hairs. Leaves on short stalks, almost upright, about a span long and half an inch wide, being nearly linear, acute, entire, though slightly wavy at the edges, and somewhat revolute; the upper side green, smooth, even; under pure white, with close, cottony, or rather silky, down; the midrib reddish, with numerous, short, curved transverse veins. *Stipulas* linear-lanceolate, sometimes toothed at one side, variable in size, and often wanting. *Catkins* numerous, lateral, sessile, cylindrical, full an inch long, with several small, lanceolate bracteas. Scales small, ovate, or rounded, brown, bearded and clothed with white hairs, which do not reach to the summit of the *germen*. Nect. ovate-oblong, flattened, obtuse. Germ. sessile, ovate-lanceolate, silky. Style about a quarter

the length of the germen. *Stigmas* above half the length of the style, linear, acute, spreading slightly, undivided in our plant, as Ehrhart, like Hoffmann, describes them, though in his own published dried specimen they are cloven to the base.

The value of the Common Osier, for various kinds of basket-work, is universally known. There is a variety much esteemed, called the Velvet Osier, in which no external difference is discernible, but the twigs are said to be more pliant. There are also various species, as well as varieties, comprehended under the name of Osiers, some of which, having smooth *leaves*, are described in the earlier part of our first section. Others, generally of much less use, will presently follow; or if not British, are described, by the writer of this, in *Rees's Cyclopædia*.

Osiers differ from Sallows in their long, straight, flexible, and mostly tough, twigs; their generally sessile *germens*, and elongated *styles* and *stigmas*.

Haller refers to our *viminalis*, the *S. fragilis* of Caspar Bauhin's *Prodr.* 159, the description of which, as to its qualities, is equally unsuitable with the name. *S. folio longissimo angustissimo, utrinque albido*, *Bauh. Pin.* 474, cited, by Ehrhart, as well as by Linnæus, appears to be correct.

62. *S. Smithiana*. Silky-leaved Osier.

Leaves lanceolate, pointed, slightly wavy, minutely toothed; soft and scarce visibly downy above; whitish and silky beneath. *Stipulas* crescent-shaped, minute. *Catkins* ovate. *Germen* stalked. *Style* shorter than the linear, deeply divided, *stigmas*.

S. Smithiana. *Willd. Enum.* 1008.

S. mollissima. *Fl. Br.* 1070; *excl. the syn. Engl. Bot. v. 21. t. 1509.*
Rees's Cycl. n. 135.

In meadows and osier-grounds.

About Bury, chiefly amongst Osiers. *Mr. Crowe.* 1801. Near Pennard castle, Glamorganshire. *Mr. D. Turner.* 1803.

Shrub. *April, May.*

Branches erect, wand-like, round, long, slender, reddish, leafy, smooth; finely downy and soft when young; brittle and unfit for basket-work. *Leaves* on shortish downy *footstalks*, lanceolate, 3 or 4 inches long, tapering to a point; the margin wavy, or slightly crenate, with minute teeth here and there, especially towards the point; the upper side green, delicately soft to the touch with extremely minute, almost invisible, close, silky down; under pale, whitish, densely silky, and likewise peculiarly soft; the midrib and slender veins reddish, rather less downy. *Stipulas* very small, at first lanceolate, a little toothed, hairy; subsequently crescent-shaped. *Catkins* before the leaves, numerous,

nearly sessile, small, elliptical. *Bracteas* few, linear-lanceolate, acute, covered at the back with long silky hairs. *Scales* obovate, dark brown upwards, reaching to the middle of the silky, ovate-lanceolate, stalked *germen*, and clothed with long dense hairs, not reaching to its top. *Nect.* ovate-oblong, bluntish. *Style* at first but half the length of the linear, deeply cloven, *stigmas*; but becoming afterwards about as long. *Caps.* silky, tapering, on a hairy stalk, and tipped with the permanent style and stigmas.

This was given to Mr. Crowe for the true Velvet Osier, and its remarkable softness suggested the name of *Salix mollissima*; which we afterwards discovered, as we thought, to have been given to the same species by Ehrhart. But his *mollissima* I have lately ascertained to be totally distinct, in *catkins* as well as *leaves*; which Willdenow first perceiving, was pleased to give our English plant the appellation here adopted. His *holosericea* is, I believe, the Velvet Osier. Both that and the *mollissima* are German, not British, natives. It is important for cultivators of Osiers to distinguish them carefully, for the Velvet Osier is, for some kinds of work, greatly esteemed; whereas *S. Smithiana*, notwithstanding the account received by Mr. Crowe, see *Fl. Brit.* 1070, proves of no utility.

63. *S. stipularis*. Auricled Osier.

Leaves lanceolate, pointed, slightly wavy, obscurely crenate; soft and nearly naked above; white and downy beneath. *Stipulas* half-heartshaped, stalked, very large. *Nectary* cylindrical. *Germen* ovate, nearly sessile, as well as the linear, undivided *stigmas*.

S. stipularis. *Fl. Br.* 1069. *Engl. Bot.* v. 17. t. 1214. *Rces's Cycl.* n. 136. *Hook. Scot.* 286. *Willd. Sp. Pl.* v. 4. 708.

In osier-holts, hedges and woods.

Near Bury St. Edmund's. *Mr. Crowe*. Common in hedges and woods in Scotland; *Mr. David Don*. *Hooker*.

Shrub. *March*.

Twigs upright, tall, soft and downy, of a pale reddish brown, brittle, and of little or no use as an Osier. *Leaves* almost upright, numerous, about a span long, sharp-pointed, unequally and slightly crenate; green, even and soft, though hardly downy, above; finely downy, and whitish, beneath, with a nearly smooth, reddish, or pale, midrib, and remarkably downy, as it were fringed, veins. *Footstalks* stout, half or three quarters of an inch long. *Stipulas* peculiar, being more or less stalked, half-heartshaped, taper-pointed, erect, longer than the footstalks, toothed, or lobed, on the outer side at the base, downy at the back. *Catkins* much earlier than the foliage, numerous, almost sessile, erect, with a few lanceolate, acute, silky *bracteas*; the barren ones rather above an inch

long, turgid, or in some measure elliptical, obtuse; fertile half as long again, cylindrical. *Scales* pale, ovate-oblong, somewhat convolute at the base, brownish at the extremity, bearded with long hairs. *Stam.* distinct. *Anth.* round, pale yellow. *Germ.* ovate, downy, very nearly sessile. *Style* short. *Stigmas* four times as long, linear, undivided, widely spreading. *Nect.* slender, cylindrical, longest in the barren catkins, being about half the length of their scales.

Easily known, at first sight, by its coarse tall habit, and conspicuous *stipulas*, but not worthy of cultivation for any economical purpose. Yet it was sent several times to the late Mr. Sowerby to draw, as the true *S. viminalis*, whose valuable qualities everybody knows. I humbly conceive that the botanical distinctions of the three last, which have not been carelessly constructed, will be found sufficient to identify them.

64. *S. alba*. Common White Willow.

Leaves elliptic-lanceolate, pointed, serrated, silky on both sides; the lowest serratures glandular. Stamens hairy. Germen smooth, almost sessile. Stigmas deeply cloven. Scales rounded.

S. alba. *Linn. Sp. Pl.* 1449. *Willd. v.* 4. 710. *Fl. Br.* 1071. *Engl. Bot. v.* 34. *t.* 2430. *Rees's Cycl. n.* 140. *Hoffm. Sal. v.* 1. 41. *t.* 7, 8. *Ehrh. Arb.* 10. *Pl. Off.* 189.

S. n. 1635. *Hall. Hist. v.* 2. 303.

Salix. *Raii Syn.* 447. *Ger. Em.* 1389. *f. Matth. Valgr. v.* 1. 180. *f. Camer. Epit.* 107. *f.*

S. folio utrinque glauco, viminibus albidioribus. *Raii Cant.* 142.

S. Dioscoridis. *Lob. Ic. v.* 2. 136. *f.*

S. vulgaris alba arborescens. *Bauh. Pin.* 473.

S. maxima fragilis alba hirsuta. *Bauh. Hist. v.* 1. *p.* 2. 212. *f.*

S. alba perticalis vulgaris. *Dalech. Hist.* 275. *f.*

β. S. cærulea. Blue Willow. *Engl. Bot. v.* 34. *t.* 2431. *Rees's Cycl. n.* 141. *Ait. Hort. Kew. ed. 2. v.* 5. 365.

S. albæ varietas. *Fl. Br.* 1072.

S. alba. *Hook. Scot.* 287.

In moist woods, low pastures, or meadows, and on the banks of rivers and ditches. *β.* Most frequent in the North.

Tree. *May*; and often again in *July*.

A tall tree, whose bark is thick, full of cracks, good for tanning, and for the cure of agues, though inferior in quality to that of *S. Russelliana*, the true Bedford, or Huntingdon, Willow; see *n.* 20. The branches are numerous, spreading widely, silky when young. Leaves all alternate, on shortish footstalks, lanceolate, broadest a little above the middle, pointed, tapering towards each end, regularly and acutely serrated, the lower serratures

most glandular ; both sides of a greyish, somewhat glaucous, green, beautifully silky, with close-pressed silvery hairs, very dense and brilliant on the uppermost, or youngest, *leaves* ; the lowermost on each branch, like the *bracteas*, are smaller, more obtuse, and greener. *Stipulas* variable, either roundish or oblong, small, often wanting. *Catkins* on short stalks, with three or four spreading leafy *bracteas*, for the most part coming before the leaves, but a few more often appear after Midsummer ; they are all cylindrical, rather slender, obtuse, near an inch and half long. *Scales* fringed, rounded at the end ; those of the barren *catkins* narrow towards the base ; of the fertile dilated and convolute in that part. *Nect.* of two obtuse glands, one before, the other behind the *stamens*. *Filaments* hairy in their lower part. *Anth.* roundish, yellow. *Germ.* very nearly sessile, green, smooth, ovate-lanceolate, bluntish, longer than the scale. *Style* short. *Stigmas* short, thickish, cloven. *Caps.* ovate, brown, smooth, rather small.

β is a very remarkable variety, so much more valuable for cultivation, that my late most accurate friend Mr. Crowe was ever anxious to find some specific character to distinguish it. We could at last only discover that the under side of the *leaves* loses, at an early period, most of its silky hairs. On this slight foundation, I presumed to publish it as a species by the name of *carulea*, as much aware as the most critical botanist could be, that such a character was not satisfactory, especially as it might originate in the quick growth of the leaves, and the consequently rapid extension of their surface. Having brought this variety into botanical notice, I wish some careful observer, pursuing Nature, not empty fame, may be more fortunate ; and if the plant can be increased by seed, it may possibly be still further improved. Its qualities are of the highest importance. The superior value of the wood and bark, the rapid growth, as well as handsome aspect, of the tree, its silvery-blue colour, its easy propagation and culture, in dry as well as wet situations, all render it so superior to our Common White Willow, that a cultivator might justly think lightly of any one, who should tell him there was no difference between them. Indeed one of the few botanists really acquainted with Willows, Mr. Borrer, has suggested that there are some presumptive distinctions even between our *S. alba* and that of Hoffmann, in the shape of the lower *leaves*, and of the *scales* of the *catkins*, as well as in the length and density of the latter. So *S. vitellina*, strangely referred to *alba* by the great Haller, differs obviously in its longer, more taper, *catkins* ; lanceolate pointed *scales* ; smooth *stamens*, and perhaps other marks ; besides its smooth adult *leaves*, which occasion it to be placed in the first section. All these things deserve inquiry. The British Willows may now, perhaps, be found tolerably intelligible ; and the foreign ones are syste-

matically detailed by Willdenow, as well as in Rees's Cyclopædia; so that, notwithstanding some ambiguities, a careful observer may become acquainted with them all. The American species are worth notice. Those of Switzerland appear to be few, and not well understood. The German botanists greatly exceed most others in a practical acquaintance with the whole genus.

DIOECIA TRIANDRIA.

449. EMPETRUM. Crow-berry.

Linn. Gen. 515. *Juss.* 162. *Fl. Br.* 1072. *Tourn. t.* 421. *Lam. t.* 803. *Gærtn. t.* 106.

Nat. Ord. Miscellanæ? *Linn.* 54. Akin to *Ericæ*. *Juss.* 51.

Rather to the *Myrsinæ*. *Br. Prodr.* 532. It has surely no affinity to the *Conifera*, as some suppose.

Bar. fl. Cal. in 3 deep, ovate, permanent segments. *Petals* 3, sometimes more, ovate-oblong, contracted at the base, larger than the calyx, withering. *Filam.* 3—9, capillary, long, pendulous. *Anth.* roundish, deeply cloven, of 2 cells.

Fert. fl. Cal. the same. *Pet.* 3, ovate-oblong, spreading, contracted at the base, longer than the calyx, withering. *Germ.* superior, orbicular, depressed. *Style* simple, erect, very short. *Stigmas* 9, oblong, spreading widely. *Berry* orbicular, depressed, wider than the calyx, of 1 cell. *Seeds* 9, erect, triangular, closely disposed in a circle, gibbous externally.

Linnaeus once saw the *flowers* with both *stamens* and *pistils*. I have such on Swiss specimens, from Mr. Davall.

Stem shrubby, of humble growth. *Leaves* scattered, or whorled, linear-oblong, revolute, evergreen. *Fl.* axillary, bracteated, reddish. *Berry* black, white, or red.

1. *E. nigrum*. Black Crow-berry, or Crake-berry.

Stem and branches procumbent. *Leaves* slightly elliptical.

E. nigrum. *Linn. Sp. Pl.* 1450. *Willd. v.* 4. 713. *Fl. Br.* 1072. *Engl. Bot. v.* 8. *t.* 526. *Hook. Scot.* 287. *Mill. Illustr. t.* 86. *Fl. Dan. t.* 975. *Dicks. H. Sicc. fasc.* 2. 10.

E. n. 1605. *Hall. Hist. v.* 2. 279.

E. montanum, fructu nigro. *Raii Syn.* 444.

Erica. *Matth. Valgr.* v. 1. 139. *f*.

E. baccifera. *Camer. Epit.* 77. *f*. *Clus. Pann.* 29. *f*. *Dalech. Hist.* 188. *f*. *Bauh. Hist.* v. 1. 526. *f*.

E. baccifera procumbens. *Ger. Em.* 1383. *f*.

E. coris folio undecima. *Clus. Hist.* v. 1. 45. *f*.

On mountainous heaths in the North abundantly.

Shrub. *May*.

A dwarf, trailing, heath-like *shrub*, with numerous, leafy, smooth, partly ascending, *branches*. *Leaves* crowded, scattered, or imperfectly whorled, hardly a quarter of an inch long, obtuse, on short stalks; dark-green and smooth above; the margins fringed, and folded in beneath. *Fl.* reddish, axillary, solitary, almost sessile, several near together, towards the tops of the last year's branches, generally dioecious, sometimes united, or partially monoecious. *Berries* half the size of a Currant, purplish-black, with a mild flavour of Elder-berries; chiefly the food of mountain birds or quadrupeds, though sometimes eaten by mankind in the most northern countries. Some report them to be unwholesome, causing head-ache. Gunner says, *Fl. Norveg.* v. 1. 11, that they make a part of the food of the Norwegian Laplanders, and that a sort of wine has been prepared from them for about 600 years past in Iceland, as well as in Norway, whence arose the report of real wine being made in those countries, which was used at the Sacrament.

450. RUSCUS. Butcher's-broom.

Linn. Gen. 534. *Juss.* 42. *Fl. Br.* 1073. *Tourn. t.* 15. *Lam. t.* 835. *Gærtn. t.* 16.

Nat. Ord. Sarmenlaceæ. *Linn.* 11. *Asparagi.* *Juss.* 12.

Barr. fl. Cal. of 6 leaves, spreading, ovate; 3 alternate ones smallest. *Cor. Pet.* none. *Nect.* central, ovate, tumid, erect, coloured, undivided, as long as the calyx; pervious at the summit. *Filam.* none. *Anth.* 3, spreading, seated on the top of the nectary; combined at the base.

Fert. fl. Cal. Pet. and Nect. as in the *barr. fl.* *Anth.* none, or imperfect. *Germ.* superior, concealed in the nectary, oblong-ovate. *Style* short and thick. *Stigm.* obtuse, prominent through the orifice of the nect. *Berry* globular, succulent, of 3 cells. *Seed* seldom more than 1, globular, hard.

Firm, rigid, evergreen, biennial *herbs*, with perennial *roots*. *Stem* branched. *Leaves* undivided, entire, continuous with the stem, mostly bearing the pale greenish *flowers*, often accompanied by a *leaflet*, either on the disk above,

or at the back. *Berries* red. Some species have united *flowers*; one or more bear them in clusters.

1. *R. aculeatus*. Common Butcher's-broom.

Leaves ovate, sharp-pointed, flowering on the upper side without a leaflet.

R. aculeatus. *Linn. Sp. Pl.* 1474. *Willd. v.* 4. 874. *Fl. Br.* 1073. *Engl. Bot. v.* 8. *t.* 560. *Hook. Scot.* 288. *Woodv. Suppl. t.* 237. *Mill. Illustr. t.* 96. *Bull. Fr. t.* 243.

R. n. 1238. *Hall. Hist. v.* 2. 116.

Ruscus. Raii Syn. 262. *Ger. Em.* 907. *f. Trag. Hist.* 919. *f. Matth. Valgr. v.* 2. 555. *f. Camer. Epit.* 935. *f. Bauh. Hist. v.* 1. 579. *f. Bauh. Pin.* 470.

Myrtacantha, Murina spina, sive Myrtus sylvestris. Lob. Ic. 637. *f.*

Δαφνη, Daphne. Diosc. Ic. 132. *f.*

Butcher's Broom. *Petiv. H. Brit. t.* 44. *f.* 4.

β. Ruscus laxus. Tr. of Linn. Soc. v. 3. 334.

On bushy heaths, and in woods, more especially on a gravelly soil.

β. At Stoke, near Gosport, plentifully. Mr. G. Caley.

Perennial. *March, April.*

Root fleshy, much divided at the crown, sending up many branched, leafy, round, rigid, furrowed *stems*, 2 feet high, not flowering till the second year, after which they die down to the root. Whole *herb* dark green, smooth in every part. *Leaves* a continuation of the branches, equally firm and durable, with scarcely any *foot-stalks*, alternate, spreading every way, obliquely twisted, ovate, not an inch long, many-ribbed, each tipped with a sharp point. *Fl.* solitary, near the middle of the upper side of each leaf, apparently sessile, but their bracteated stalk is imbedded under the cuticle, and runs down to the base of the leaf. *Cal.* pale green. *Nect.* purplish. *Berry* the size of a Red Currant, scarlet, juicy and sweetish. *Seeds* originally 6, but only 1 or 2 come to perfection. These are hard, white, semitransparent. Instead of a *leaflet*, of considerable size, accompanying the *flower*, in some species, there is in this a small spine, or bristle, winged at the base, besides 2 or 3 membranous *bracteas*, on the elongated fruit-stalk.

The variety *β* has more extended and wavy *branches*, the *leaves* rather elliptical than ovate, tapering at the base. It can scarcely be considered as more than a variety, being itself liable to several different appearances.

DIOECIA TETRANDRIA.

451. VISCUM. Misseltoe.

Linn. Gen. 517. *Juss.* 212. *Fl. Br.* 1074. *Tourn. t.* 380. *Lam. t.* 807. *Gærtn. t.* 27.

Nat. Ord. Aggregatæ. *Linn.* 48. *Caprifolia.* *Juss.* 58. *Loranthææ.* "Richard and *Juss. Ann. du Mus.* v. 12. 292." *DeCand.* 61.

Barr. fl. Cal. a slight border. *Cor.* of 1 petal, in 4 deep, ovate, acute, equal segments. *Filam.* none. *Anth.* 4, ovate, compressed, sessile on the base of each segment of the corolla, all over pitted, or cellular.

Fert. fl. Cal. a rather more evident border, superior. *Pet.* 4, ovate, dilated at the base, equal, deciduous. *Germ.* inferior, ovate, crowned with the calyx. *Style* none. *Stigma* obtuse, undivided. *Berry* globular, smooth, juicy, viscid, of 1 cell. *Seed* 1, heart-shaped, compressed, obtuse, sometimes with a double *embryo*.

Parasitical on trees, shrubby, branched, smooth, pale green. *Leaves* opposite, simple, undivided, entire, rigid. *Fl.* greenish. *Berries* of various colours.

1. *V. album.* Common White Misseltoe.

Leaves obovate-lanceolate, obtuse. Stem forked, with sessile intermediate heads, of about five flowers.

V. album. *Linn. Sp. Pl.* 1451. *Willd. v.* 4. 737. *Fl. Br.* 1074. *Engl. Bot. v.* 21. *t.* 1470. *Hook. Scot.* 288. *Mill. Illustr. t.* 87. *Woodv. suppl. t.* 270.

V. n. 1609. *Hall. Hist. v.* 2. 282.

V. baccis albis. *Bauh. Pin.* 423. *Duham. Arb. v.* 2. 354. *t.* 104.

Viscum. *Raii Syn.* 464. *Ger. Em.* 1350. *f. Trag. Hist.* 949. *f. Fuchs. Hist.* 329. *f. Ic.* 187. *f. Lonic. Kreuterb.* 87. *f. 3. Matth. Valgr. v.* 2. 161. *f. Camer. Epit.* 555. *f.*

Parasitical on trees, especially the Apple-tree, Hawthorn, Lime, Oak, &c.

Shrub. *May.*

Root woody, thick, very hard, incorporated deeply with the wood of the *tree* on which it grows, without any *radicles*. *Stem* bushy, repeatedly forked, jointed, round, smooth, pale green,

about a foot high. *Leaves* of rather a deeper hue, one inch and half long, rigid, almost woody, with parallel ribs, evergreen. *Fl.* in small, axillary, yellowish heads, about 5 in each head. *Berries* white, pellucid, the size of a Currant, sweet, very glutinous internally, serving to make the best birdlime, when boiled with a small portion of vegetable oil.

Loranthus europæus seems to be the original, or most common Misseltoe, ἰξός, of the Greeks, which grows usually on some kind of Fir-tree. But our *Viscum album* is likewise found in Greece, though rarely, growing on the Oak; and this has been preferred from the most remote antiquity. Hence, when the superstitions of the East travelled westward, our Druids adopted a notion of the Misseltoe of the Oak being more holy, or efficacious, in conjurations or medicine, than what any other tree afforded, the *Loranthus*, or ordinary Misseltoe, not being known here. This superstition actually remains, and a plant of *Viscum* gathered from an oak, is preferred by those who rely on virtues, which perhaps never existed in any Misseltoe whatever.

452. HIPPOPHÆE. Sallow-thorn.

Linn. Gen. 517. *Juss.* 75. *Fl. Br.* 1075. *Lam. t.* 808. *Gærtn. t.* 42. *Rhamnoides. Tourn. t.* 481.

Nat. Ord. Calycifloræ. Linn. 16. *Elæagni. Juss.* 24. *Santalaceæ. Brown Prodr. Nov. Holl.* 350.

Barr. fl. Cal. in 2 deep, roundish, valvular segments, originally folded flatly together. *Cor.* none. *Filam.* 4, very short, erect. *Anth.* terminal, oblong, angular, erect, of 2 cells, not projecting beyond the calyx.

Fert. fl. Cal. of 1 leaf, inferior, tubular, cloven at the summit, deciduous. *Cor.* none. *Germ.* superior, small, roundish. *Style* short and thick. *Stigma* simple, oblong, projecting beyond the calyx. *Berry* globular, very juicy, of 1 cell, with a thin skin. *Seed* solitary, oblong, polished, with a furrow at each side, invested with a double membranous *tunic*, the outermost perhaps only the proper lining of the cell.

Thorny *shrubs*, with opposite or alternate, stalked, simple, undivided, entire *leaves*, scaly and silvery, especially beneath. *Fl.* from the same *buds*, below the leaves, aggregate, small, greenish. *Berries* acid, not unwholesome. Some of the *flowers* are reported to have *stam.* and *pist.* occasionally in the same individual.

1. *H. rhamnoides*. Common Sallow-thorn, or Sea Buck-thorn.

Leaves linear-lanceolate, scattered.

H. rhamnoides. *Linn. Sp. Pl.* 1452. *Willd. v.* 4. 743. *Fl. Br.* 1075. *Engl. Bot. v.* 6. t. 425. *Pall. Ross. v.* 1. t. 68. *Fl. Dan. t.* 265. *Ehrh. Arb.* 110.

H. n. 1603. *Hall. Hist. v.* 2. 278.

H. dioscoridis? *Column. Ecphr. v.* 1. 36; *no fig.*

Rhamnoides fructifera, *foliis salicis*, *baccis leviter flavescentibus*. *Raii Syn.* 445.

Rhamnus secundus. *Clus. Hist. v.* 1. 110. *f.* *Ger. Em.* 1334. *f.*

Rhamni species. *Camer. Epit.* 81. *f.*

Oleaster germanicus. *Cord. Hist.* 186. *f.*

On sandy cliffs, on the east coast of England.

Upon cliffs above the level of the sea, from Kent to Yorkshire.

Ray. Plentiful between Yarmouth and Cromer, Norfolk.

Shrub. *May*.

A bushy rigid *shrub*, 5 feet or more in height, with hard wood, and straight, spreading, leafy *branches*, each terminating in a *thorn*. *Leaves* numerous, deciduous, scattered, linear-lanceolate, mostly bluntish, one inch and half long, on short stalks; dark green on the upper side, minutely dotted, not scaly; beautifully silvery, as well as scaly, beneath. *Fl.* green, minute, solitary in the bosoms of some of the lowermost leaves while very young. *Berries* somewhat stalked, rather elliptical, orange-coloured, simply, but powerfully, acid, pleasant enough when preserved with sugar. They are seldom, if ever, ripened in gardens, though the shrub is very commonly cultivated for the beauty and singularity of its foliage. Gardeners should attend to the *flowers* being dioecious, and plant both sorts together.

These *berries* afford a kind of sauce to the poor in Sweden and the South of France. Haller speaks of them as ill-flavoured. Rousseau gives an account of the singular politeness of a young Frenchman, the companion of his walks, who seeing him gather and eat this fruit, did not presume to warn him of its being reputed poisonous.

453. MYRICA. Gale.

Linn. Gen. 518. *Juss.* 409. *Fl. Br.* 1076. *Lam. t.* 809. *Gærtn. t.* 39.

Gale. *Dill. Gen.* 194. t. 10. *f.* A—E.

Nat. Ord. *Amentaceæ*. *Linn.* 50. *Juss.* 99.

Barr. fl. *Catkin* ovate-oblong, loosely imbricated in every direction. *Cal.* a single, ovate, bluntish, concave *scale* to each floret. *Cor.* none. *Filam.* 4, rarely more, short, capillary, erect. *Anth.* vertical, large, of 2 divided lobes.

Fert. fl. Catkin as in the barr. fl. *Cal.* nearly the same. *Cor.* none. *Germ.* ovate, flattish, superior. *Styles* 2, thread-shaped, spreading, longer than the calyx. *Stigm.* simple, acute. *Berry* of 1 cell, various in substance. *Seed* 1.

Aromatic *shrubs*. *Leaves* mostly, if not always, simple, generally more or less serrated, besprinkled with resinous dots. *Stipulas* none, or evanescent. *Catkins* axillary, expanding early in the following year.

1. *M. Gale*. Sweet Gale, or Dutch Myrtle.

Leaves lanceolate, serrated; tapering and entire at the base. *Scales* of the catkins pointed.

M. Gale. *Linn. Sp. Pl.* 1453. *Willd. v. 4.* 745. *Fl. Br.* 1076. *Engl. Bot. v. 8. t. 562.* *Hook. Scot.* 288. *Fl. Dan. t. 327.* *Ehrh. Pl. Off.* 339.

Gale frutex odoratus septentrionalium, Elæagnus Cordo. Raii Syn. 443. *Bauh. Hist. v. 1. p. 2.* 224. *f.*

Elæagnus. Cord. Hist. 212. 2. *f.* *Lob. Ic. v. 2.* 116. *f.*

Myrtus brabantica, sive Elæagnus Cordi. Ger. Em. 1414. *f.*

Rhus myrtifolia belgica. Bauh. Pin. 414.

R. sylvestris altera. Dalech. Hist. 110. *f.*

In bogs and marshes, especially on a gravelly soil.

Shrub. May.

Stem upright, bushy, 3 or 4 feet high, with numerous alternate branches. *Leaves* alternate, on short stalks, obovate-lanceolate, acute, serrated in their upper part, one inch and half long, deciduous; green and smooth on both sides; the under side palest. *Catkins* numerous, sessile, formed during summer in the bosoms of the leaves, and remaining through the winter. In the following March they are full-grown, expanding in May. *Scales* of a red shining brown; the lower ones of the fertile catkins hairy towards the tip. *Berries* very small, covered with resinous dots, exhaling a delightful fragrance when rubbed between the fingers. The *leaves* are fragrant from the same cause. Sometimes barren and fertile *catkins* are produced by the same individual, as was first remarked by the late Mr. Templeton.

This plant, perhaps one of the more innocent substitutes for Hops, is used for brewing by the poor in Sweden. Linnæus says the berries boiled in water yield wax, like those of *M. cerifera*, or Candle-berry Myrtle. If so, they should seem to secrete an essential aromatic oil besides.

DIOECIA PENTANDRIA.

454. HUMULUS. Hop.

Linn. Gen. 522. *Juss.* 404. *Fl. Br.* 1077. *Lam. t.* 815.

Lupulus. Tourn. t. 309. *Gærtn. t.* 75.

Nat. Ord. Scabridæ. Linn. 53. *Urticæ. Juss.* 98.

Barr. fl. Cal. of 5 oblong, concave, obtuse leaves. *Cor.* none. *Filam.* 5, capillary, very short. *Anth.* vertical, oblong, of 2 cells, opening by 2 terminal pores.

Fert. fl. Catkin of numerous, membranous, imbricated, concave *scales*, 1 to each floret. *Cor.* none, except a double inner scale be taken for such. *Germ.* superior, minute, oblong. *Styles* 2, awl-shaped, spreading, downy. *Stigmas* simple. *Seed* tunicated, attached to the base of each enlarged, membranous, dry scale of the *cone*.

Only one species.

1. H. *Lupulus.* Common Hop.

H. Lupulus. Linn. Sp. Pl. 1457. *Willd. v.* 4. 769. *Fl. Br.* 1077. *Engl. Bot. v.* 6. *t.* 427. *Hook. Scot.* 288. *Mill. Illustr. t.* 88. *Fl. Dan. t.* 1239. *Bull. Fr. t.* 234.

Lupulus n. 1618. *Hall. Hist. v.* 2. 290.

L. mas et foemina. Raii Syn. 137. *Bauh. Hist. v.* 2. 151. *f.* 152. *f.*

Lupulus. Trag. Hist. 812. *f.* *Matth. Valgr. v.* 2. 553. *f.* *Camer. Epit.* 933, 934. *f., f.*

Lupus salictarius. Ger. Em. 885. *f.* *Fuchs. Hist.* 164. *f.* *Ic.* 92. *f.* *Lob. Ic.* 629. *f.*

Hops. Petiv. H. Brit. t. 1. *f.* 1, 2.

In thickets and hedges, especially where the soil is stiff and rather moist.

Perennial. *July.*

Root branched, moderately creeping. *Stems* herbaceous, twining, climbing to the height of several feet, branched, leafy, angular, hollow, rough with small hooked prickles. *Leaves* opposite, stalked, heart-shaped, acute, serrated, either undivided or three-lobed, very harsh on both sides, like those of a Fig, with minute points, whence the excellent Linnæan name of this Natural Order. *Footstalks* prickly, connected at the base by a pair of large, membranous, reflexed, intermediate *stipulas*. *Fl.* pale green, pendulous; the barren ones in compound axillary *panicles*; fertile *catkins* few, on axillary simple stalks. The ripe *cones* are bitter, viscid, highly aromatic, well known for their use in making beer, and reputed to have a narcotic property.

I have sometimes suspected Hops not to be indigenous, which was also the opinion of Lightfoot, with regard to Scotland. But Haller says they are never cultivated in Switzerland, where nevertheless the wild plant is abundant, and it may with equal probability be reckoned a native of Britain. The young sprouts boiled have the flavour of Asparagus, and are more early.

DIOECIA HEXANDRIA.

455. TAMUS. Black Bryony.

Linn. Gen. 524. *Fl. Br.* 1078.

Tamnus. Tourn. t. 28. *Juss.* 43. *Lam. t.* 817.

Nat. Ord. Sarmenlaceæ. Linn. 11. *Asparagi. Juss.* 12.

Asphodeleæ. Br. Prodr. 274. See *v.* 2. 152. *n.* 195.

Barr. fl. Cal. none. *Cor.* regular, in 6 deep, ovate-lanceolate segments; their upper part spreading horizontally. *Filam.* 6, awl-shaped, simple, equal, shorter than the corolla. *Anth.* roundish, erect.

Fert. fl. Cal. none. *Cor.* as in the *barren fl.* superior, deciduous. “*Nect.* a small oblong pore, at the inside of the base of each segment.” *Linn.* *Germ.* inferior, ovate-oblong, large, smooth. *Style* short, cylindrical, the length of the corolla. *Stigm.* 3, spreading, acute. *Berry* juicy, oval, of 3 cells. *Seeds* 2 in each cell, with a blackish brittle *skin*.

Herbaceous climbers, with perennial fleshy roots. *Leaves* simple, stalked, alternate. *Fl.* greenish, in clusters. *Berries* red, with viscid juice.

1. *T. communis.* Common Black Bryony.

Leaves heart-shaped, undivided, acute.

T. communis. Linn. Sp. Pl. 1458. *Willd. v.* 4. 772. *Fl. Br.* 1078.

Engl. Bot. v. 2. *t.* 91. *Mill. Illustr. t.* 89.

T. n. 1620. *Hall. Hist. v.* 2. 291.

Tamnus racemosa, flore minore luteo-pallescente. Raii Syn. 262.

Bryonia nigra. Ger. Em. 871. *f.*

Vitis nigra. Matth. Valgr. 622. *v.* 2. *f.* *Camer. Epit.* 988. *f.* *Dalech. Hist.* 1412. *f.*

V. sylvestris. *Dod. Pempt.* 401. *f.*

In tall hedges, shady thickets, groves and woods, common.

Perennial. *June.*

Root large and fleshy, black externally, white within ; of an acrid quality, formerly used for stimulating plaisters, and sometimes given internally as an expectorant, or diuretic. *Stems* twining, climbing without tendrils to a considerable height, gracefully hanging in festoons, adorned with scarlet *berries*, from tree to tree, in autumn. The whole plant is smooth. *Leaves* bright green, shining, entire. *Stipulas* in pairs, awl-shaped. *Fl.* greenish white, in imperfectly whorled, axillary, stalked *clusters*, with minute *bracteas* under their partial stalk, resembling the *stipulas*, but smaller.



DIOECIA OCTANDRIA.

456. POPULUS. Poplar.

Linn. Gen. 526. *Juss.* 409. *Fl. Br.* 1079. *Tourn. t.* 365. *Lam. t.* 819. *Gærtn. t.* 90.

Nat. Ord. *Amentaceæ.* *Linn.* 50. *Juss.* 99. See *n.* 448.

Barr. fl. *Catkin* oblong, cylindrical, loosely imbricated every way, many-flowered. *Cal.* a single-flowered, wedge-shaped, flat *scale*, unequally jagged at the summit. *Cor.* of 1 petal; turbinate and tubular below; dilated, undivided, obliquely cup-shaped in the border. *Filam.* 8, or more, capillary, very short. *Anth.* drooping, large, quadrangular.

Fert. fl. *Catkin* as in the *barr. fl.* but generally shorter. *Scale* and *Cor.* similar to the *barr. fl.* *Germ.* superior, ovate, pointed. *Style* none. *Stigm.* 4 or 8, awl-shaped. *Caps.* ovate, of 2 concave valves, and 1 cell. *Seeds* numerous, small, ovate, each crowned with a tuft of fine hairs.

Lofty *trees*, with gummy *buds*, and deciduous, alternate, roundish or angular, stalked *leaves*. *Stipulas* in pairs. *Catkins* early, pendulous. Natives of Europe and North America.

1. *P. alba.* White Poplar. Abele-tree.

Leaves lobed and toothed; somewhat heart-shaped at the base; snow-white and densely downy beneath. Fertile catkins ovate. Stigmas four.

P. alba. *Linn. Sp.* 1463. *Willd. v. 4.* 802. *Fl. Br.* 1079. *Engl. Bot. v. 23. t.* 1618. *Hook. Scot.* 288. *Raii Syn.* 446. *Ger. Em.* 1486. *f. Bauh. Hist. v. 1. p. 2.* 160. *f. Matth. Valgr. v. 1.* 123. *f. Camer. Epit.* 65. *f. Dod. Pempt.* 835. *f. Dalech. Hist.* 86. *f. Ehrh. Arb.* 120.

P. alba latifolia. *Lob. Ic. v. 2.* 193. *f.*

P. albæ alia species. *Trag. Hist.* 1081.

P. n. 1634. *Hall. Hist. v. 2.* 303.

P. major. *Mill. Dict. ed. 8. n.* 4.

P. nivea. *Willd. Berl. Baumz.* 227.

In moist woods; sometimes in dry mountainous situations.

Tree. *March.*

Root creeping, with plentiful suckers. Trunk various in height, with a smoothish bark, and horizontal branches, which are very white and cottony when young. Leaves angular, generally with three principal lobes, variously and unequally toothed, blunt-pointed, veiny; dark green and smooth above; remarkable for the exquisite whiteness of their under side, covered with a very dense, cottony substance. Footstalks not half so long as the leaves, each accompanied at the base by a pair of small, lanceolate stipulas, often obsolete or wanting. On young luxuriant branches the leaves are almost palmate. Barren catkins cylindrical, pendulous, 3 inches long, with brown fringed scales. Stam. 8, sometimes 12, or 20, with short, thick, violet-coloured anthers. Fertile catkins ovate, half as long again before they fade; their scales rather smaller. Germ. embraced in its lower half by the corolla, ovate, green, smooth. Stigm. 4, spreading, linear-awl-shaped, pale, downy.

The wood is white, soft, tough, and of a close grain, serving chiefly for coarse purposes.

2. *P. canescens.* Grey Poplar.

Leaves roundish, deeply waved, toothed; hoary and downy beneath. Fertile catkins cylindrical. Stigmas eight.

P. canescens. *Fl. Br.* 1080. *Engl. Bot. v. 23. t.* 1619. *Willd. Sp. Pl. v. 4.* 802. *Ait. Hort. Kew. ed. 2. v. 5.* 395.

P. alba. *Mill. Dict. ed. 8. n. 1.* *Willd. Berl. Baumz.* 227.

P. alba, foliis minoribus. *Bauh. Pin.* 429. *Raii Syn.* 446. *Ger. Em.* 1487. *f. Lob. Ic. v. 2.* 193. *f.*

P. alba folio minore. *Bauh. Hist. v. 1. p. 2.* 160. *f.*

P. n. 1634 β . *Hall. Hist. v. 2.* 303.

In wet turfy meadows, near rivers, or on dry elevated heaths, in a light loamy soil.

Frequent in Norfolk, as on Wells heath, and other places near Holkham. *Mr. Crowe*. Also about Seething.

Tree. *March*.

Root creeping full as extensively as the last. *Tree* tall and handsome, with more upright and compact branches; the bark smooth, of a beautiful grey silvery hue. *Leaves* rounder, more conspicuously 3-ribbed, less deeply or acutely lobed; downy beneath, but chiefly greyish, not so white or cottony; sometimes smooth. *Catkins* all cylindrical, pendulous, about 2 inches long; distinguished essentially from the foregoing, as *Mr. Crowe* first discovered, by the stigmas, which are 8, spreading in two opposite directions. The scales of the fertile catkins are also more deeply and regularly cut. *Mr. Crowe* was very instrumental in bringing this tree into notice in Norfolk. He observed it to be of slower growth than *P. alba*, with which many British, as well as foreign, botanists have, from time to time, confounded it. The wood, though, till lately, but little used or distinguished, is much firmer than that of any other British Poplar, making as good floors as the best Norway Fir in appearance, and having moreover this valuable property, that it will not, like any resinous wood, readily take fire.

3. *P. tremula*. Aspen, or Trembling Poplar.

Leaves nearly orbicular, toothed; smooth on both sides.

Footstalks compressed. Young branches hairy. Stigmas four, erect, auricled at the base.

P. tremula. *Linn. Sp. Pl.* 1464. *Willd. v. 4.* 803. *Fl. Br.* 1081. *Engl. Bot. v. 27. t.* 1909. *Hook. Scot.* 289. *Bauh. Pin.* 429.

P. n. 1633. *Hall. Hist. v. 2.* 303.

P. Lybica. *Raii Syn.* 446. *Ger. Em.* 1487. *f. Lob. Ic. v. 2.* 194. *f. Bauh. Hist. v. 1. p. 2.* 163. *f. Matth. Valgr. v. 1.* 125. *f. Camer. Epit.* 67. *f. Dod. Pempt.* 836. *f. Dalech. Hist.* 87. *f.*

P. nigra. *Trag. Hist.* 1083. *f.*

In moist woods, or in dry gravelly lanes and pastures occasionally.

Tree. *March, April*.

A lofty round-headed tree, with creeping roots, the suckers from which, as well as the young branches, are clothed with brown, prominent hairs; being sometimes hoary, but not cottony. *Leaves* roundish with a little point, smooth on both sides, 3-ribbed like the last, bluntly toothed, somewhat wavy, often shorter than their footstalks, which, being vertically compressed, counteract the ordinary undulating motion of the leaves in the wind, and cause them to quiver with the slightest breeze; whence

the name ; and the proverbial “ trembling of an Aspen leaf.” *Stipulas* awl-shaped, hairy like the very youngest leaves, which alone they accompany. Barren *catkins* lax, near 3 inches long, with deep-cut hairy *scales*. *Stam.* 8, occasionally perhaps more. Fertile ones rather shorter, their *scales* palmate and acutely notched, brown, hairy. *Germ.* roundish, sheathed by the *corolla*. *Stigmas* 4, erect, awl-shaped, triangular, bright crimson ; the outer edge more or less wavy, extending at the base into two small oblong, reflexed, wavy *auricles*, each common to two of the stigmas, and, when fresh, of the same rich colour.

The *wood* is white, soft, light, and of a fine grain ; the *bark*, according to Linnæus, the favourite food of Beavers. He thought he detected in it the flavour of the drug called Castor.

4. *P. nigra*. Black Poplar.

Leaves deltoid, pointed, serrated, smooth on both sides.

Catkins all lax and cylindrical. Stigmas four, simple, spreading.

P. nigra. Linn. *Sp. Pl.* 1464. Willd. *v.* 4. 804. *Fl. Br.* 1081. *Engl. Bot. v.* 27. *t.* 1910. Hook. *Scot.* 289. Rati *Syn.* 446. Ger. *Em.* 1486. *f.* Lob. *Ic.* *v.* 2. 194. *f.* Bauh. *Hist. v.* 1. *p.* 2. 155. *f.* Matth. *Valgr. v.* 1. 124. *f.* Camer. *Epit.* 66. *f.* Dod. *Pempt.* 836. *f.* Dalech. *Hist.* 86. *f.* Mill. *Illustr. t.* 90.

P. n. 1632. Hall. *Hist. v.* 2. 302.

P. alba. Trag. *Hist.* 1080. *f.*

In watery places, about the banks of rivers.

Tree. March.

A tall umbrageous tree, without suckers. Wood tough, and close-grained. Bark thick, blackish, somewhat spongy. Branches smooth ; rarely hairy when young. Leaves twice the length of their footstalks, deltoid, or unequally quadrangular, deep green, very smooth, pointed, serrated ; the base more entire, as in the other species ; the under side palest. Catkins all long, loose and pendulous, measuring 3 or 4 inches. Scales of both kinds palmate, hairy, occasionally smooth. *Stam.* 8, scarcely more with us, though Linnæus and Leers describe 16. *Germ.* ovate, but slender, closely sheathed at the base only with the regular cup-like *corolla*. *Stigm.* 4, awl-shaped, simple, moderately spreading, reddish.

The stigmas prove J. Miller's plate to be so far correct, though referred in *Fl. Br.* to *P. canescens*, to which possibly the leaves may belong.

Several species or varieties, more or less agreeing with our's, but not yet noticed wild in England, have been sent from Bremen by the accurate Prof. Mertens. They merit examination in their parts of fructification, which by the foregoing descriptions appear

to be of material importance, particularly the *stigmas*. Several exotic species, cultivated in England, require to be better distinguished and more correctly named.

457. RHODIOLA. Rose-root.

Linn. Gen. 526. *Juss.* 307. *Fl. Br.* 1082. *Lam. t.* 819.

Nat. Ord. *Succulentæ*. *Linn.* 13. *Sempervivæ*. *Juss.* 83.

Barr. fl. *Cal.* concave, in 4 deep, obtuse, equal, spreading permanent segments. *Pet.* 4, alternate with the calyx, and much longer, lanceolate, bluntish, moderately spreading, deciduous. *Nect.* 4, glandular, notched, opposite to the petals, shorter than the calyx. *Filam.* 8, awl-shaped, equal in length to the petals. *Anth.* roundish. Rudiment of 4 *germens*, more or less perfect, with abortive *styles* and *stigmas*.

Fert. fl. *Cal.* as in the *barr. fl.* *Pet.* less developed, variable in length. *Nect.* as in the *barr. fl.* *Stam.* none. *Germ.* 4, superior, erect, oblong, triangular, each terminating in a short, thick, simple *style*. *Stigm.* blunt. *Caps.* 4, pointed, bursting at the inner margin, of 1 cell. *Seeds* roundish, numerous, ranged along the inner margin, at each side.

Root fleshy, perennial. *Herb* succulent, smooth, glaucous. *Fl.* terminal, cymose, occasionally, as it is said, with both organs perfect; but this is usually in appearance only; and though Mr. Dahl has observed them to be sometimes five-cleft and decandrous, I cannot, for that reason, concur with the learned Schreber, in making the plant a *Sedum*. See his *Gen. Pl.* 839. One species only is known.

1. *R. rosea*. Mountain Rose-root.

R. rosea. *Linn. Sp. Pl.* 1465. *Willd. v.* 4. 807. *Fl. Br.* 1082. *Engl. Bot. v.* 8. *t.* 508. *Hook. Scot.* 289. *Fl. Dan. t.* 183.

Sedum n. 953. *Hall. Hist. v.* 1. 411.

Anacampseros radice rosam spirante major. *Raii Syn.* 269.

Rhodia radix. *Bauh. Pin.* 286. *Trag. Hist.* 913. *f. Ger. Em.* 532. *f. Matth. Valgr. v.* 2. 372. *f. Camer. Epit.* 769. *f. Fuchs. Hist.* 665. *f. Dalech. Hist.* 982. *f. Cord. Hist.* 137. 2. *f.*

Telephium luteum minus, radice rosam redolente. *Moris. v.* 3. 468. *sect.* 12. *t.* 10. *f.* 8.

Rose-root. *Petiv. H. Brit. t.* 42. *f.* 2.

In the fissures of alpine rocks, or maritime cliffs.

Plentiful on the highest mountains of Wales and the north of Yorkshire. *Ray*. On almost all the Highland Alps, and very frequently by the sea-side upon bold rocky shores of the Hebrides. *Lightfoot*. Upon the northern coast of Ireland. *Mr. Templeton*. On Maze Beck Scar, Westmoreland. *Rev. Mr. Harriman*, and *Mr. Oliver*.

Perennial. *May, June*.

Root thick, and rather fleshy, much divided at the crown, the cuticle grey, and smooth like satin. When recently dried, the whole has an agreeable scent, resembling rose-water. *Stems* several, herbaceous, simple, leafy, about a span high. *Leaves* numerous, scattered, somewhat imbricated, obovate, pointed, bluntly toothed, glaucous, fading soonest in the barren plant, and turning red. *Cyme* of many yellow flowers, with blueish anthers.

A plant of *Rhodiola*, brought from Lapland by Rudbeck, lived for many years in the Upsal garden, without perfecting any seed; till an individual with more complete anthers was planted near it, after which seeds were regularly ripened every year. Hence it is proved to be naturally dioecious, though possibly both organs may sometimes become efficient in the same flower, as happens in various other instances.



DIOECIA ENNEANDRIA.

458. MERCURIALIS. Mercury.

Linn. Gen. 527. *Juss.* 385. *Fl. Br.* 1083. *Tourn. t.* 308. *Lam. t.* 820. *Gærtn. t.* 107.

Nat. Ord. *Tricoccæ*. *Linn.* 38. *Euphorbiæ*. *Juss.* 96.

Barr. fl. Cal. in 3 deep, ovate, concave spreading segments. *Cor.* none. *Filam.* 9—12, capillary, erect, nearly equal to the calyx. *Anth.* of 2 globular lobes, bursting along the upper side.

Fert. fl. Cal. like the *barr. fl.* *Cor.* none. *Nect.?* 2 awl-shaped bodies, found occasionally at the opposite sides of the germen, pressed close to its furrows. *Germ.* superior, roundish, compressed, with a furrow at each side, bristly. *Styles* 2, widely spreading, tapering, rough. *Stigm.* acute. *Caps.* of 2 globular lobes, and 2 elastic cells. *Seeds* solitary, globular.

Annual or perennial, simple or branched *herbs*, with opposite, stalked, simple, undivided *leaves*, and stalked, green, mostly aggregate, *flowers*; their qualities narcotic, fetid, and dangerous. Various parts of the herbage acquire a blue or purplish hue in decay, or in drying.

1: *M. perennis*. Perennial Mercury.

Stem perfectly simple. Leaves rough. Root creeping.

M. perennis. Linn. *Sp. Pl.* 1465. Willd. v. 4. 809. *Fl. Br.* 1033. *Engl. Bot.* v. 26. t. 1872. Hook. *Scot.* 289. Curt. *Lond. fasc.* 2. t. 65. Mill. *Illustr.* t. 91. *Fl. Dan.* t. 400. Bull. *Fr.* t. 303.

M. n. 1601. Hall. *Hist.* v. 2. 277.

M. perennis repens, *Cynocrambe dicta*. Raii *Syn.* 138.

Cynocrambe. Ger. *Em.* 333. f. Fuchs. *Hist.* 444. f. Ic. 250. f. Matth. *Valgr.* v. 2. 635. f.

C. mas et foemina. Camer. *Epit.* 998, 999. f, f. Bauh. *Hist.* v. 2. 979. f, f.

Dog's Mercury. Petiv. *H. Brit.* t. 1. f. 5, 6.

On banks, and in bushy places, or groves, very common.

Perennial. April, May.

Root creeping widely. Herb rough, fetid, very poisonous, though, as appears from the accounts of antient writers, it may be eaten boiled, as a pot-herb, if mixed with mucilaginous plants, and oily substances. Instances are however recorded of the fatal consequences of its use occasionally in this country. The stems are unbranched, square, a foot high, leafy in the upper part. Leaves ovate, acute, serrated, 2 or 3 inches long, with small stipulas. Fl. on axillary stalks, in interrupted, erect spikes; the barren ones most numerous. Supposed *Nect.* very narrow, rising above the styles.

2. *M. annua*. Annual Mercury.

Stem cross-branching. Leaves smooth. Root fibrous.

Barren flowers in numerous, spiked, alternate tufts.

M. annua. Linn. *Sp. Pl.* 1465. Willd. v. 4. 810. *Fl. Br.* 1034. *Engl. Bot.* v. 8. t. 559. Hook. *Scot.* 290. Curt. *Lond. fasc.* 5. t. 68. Bull. *Fr.* t. 159, 235.

M. n. 1600. Hall. *Hist.* v. 2. 276.

M. annua glabra vulgaris. Raii *Syn.* 139.

M. mas et foemina. Ger. *Em.* 332. f, f. Fuchs. *Hist.* 475, 476. f, f. Ic. 269, 270. f, f. Bauh. *Hist.* v. 2. 977. f, f. Matth. *Valgr.* v. 2. 633, 634. f, f. Camer. *Epit.* 996, 997. f, f. Lob. *Ic.* 259. f, f.

French Mercury. Petiv. *H. Brit.* t. 1. f. 7, 8.

In waste or cultivated ground, but not very frequent.

Abundant about London, Norwich, and other towns. Found

DIOECIA—ENNEANDRIA. *Hydrocharis*. 249

also in Scotland, according to Lightfoot and Hooker ; though Dr. Alston asserted the contrary.

Annual. *July—September*.

Root much branched ; simple at the crown. *Herb* from 6 to 12 inches high, erect, bushy, smooth, of a bright shining green, disposed to turn blueish after drying, like the foregoing. *Branches* numerous, crossing each other. *Leaves* ovate-lanceolate, less copiously serrated. *Fl.* green ; the barren ones in small *tufts*, ranged in interrupted *spikes* ; fertile ones fewer, stalked, axillary, destitute of *nectaries*. The qualities of this are like the last, though supposed rather less virulent.

Dr. Alston reported that the fertile plant sometimes bore ripe *seed*, though at a distance from the barren or stamiferous one. In fact, a few flowers with *stamens* have, by several persons, been found now and then intermixed with the others, which will account for the above phænomenon.

459. HYDROCHARIS. Frog-bit.

Linn. Gen. 527. *Juss.* 67. *Fl. Br.* 1084. *Lam. t.* 820.

Morsus ranæ. Dill. Gen. 149. *t.* 9. *f.* A—F.

Nat. Ord. Palmæ. Linn. 1. *Hydrocharides. Juss.* 22. *DeCand.* 115.

Barr. fl. Cal. in 3 deep, equal, ovate-oblong, concave segments, membranous at the edges. *Pet.* 3, much larger, roundish, undulated, alternate with the calyx. *Filam.* 9, awl-shaped, erect, in 3 rows ; the intermediate row producing, from its base internally, an awl-shaped stalk, or beak, resembling a style, stationed in the centre of the flower ; the 2 other rows are connected at the base, both adhering to the aforesaid stalk. *Anth.* below the pointed summit of each filament, at the inside, of 2 round lobes, those of the 2 outer rows chiefly perfect.

In the centre are occasional rudiments of a *germen*.

Fert. fl. Cal. and *Pet.* as in the *barr. fl.* *Germ.* inferior, roundish. *Styles* 6, as long as the calyx, compressed, channelled. *Stigmas* cloven, acute. *Caps.* nearly globular, leathery, of 6 cells. *Seeds* numerous, roundish, minute.

An aquatic, floating, smooth *herb*, the only species, is nearly allied to *Stratiotes*, v. 3. 33. It increases by floating *runners*, and has no other *stem*. The *leaves* are entire. *Fl.* radical, stalked, white ; each of the barren ones with a simple, concave, sheathing *bractea*. There are sometimes a few imperfect *anthers*, clustered about

the base of the *styles*; the flowers, though effectually dioecious, as in *Rhodiola*, n. 457, are incompletely so in structure.

1. *H. Morsus ranæ*. Common Frog-bit.

H. Morsus ranæ. Linn. *Sp. Pl.* 1466. Willd. v. 4. 812. *Fl. Br.* 1034. *Engl. Bot.* v. 12. t. 808. Hook. *Scot.* 290. Curt. *Lond. fasc.* 3. t. 64. *Fl. Dan.* t. 878.

H. n. 1068. Hall. *Hist.* v. 2. 21.

Stratiotes foliis Asari, semine rotundo. Raii Syn. 290.

Morsus ranæ. Ger. Em. 818. f. *Lob. Ic.* 596. f.

Nymphæa alba minima. Bauh. Pin. 193.

N. parva. Matth. Valgr. v. 2. 247. f. *Camer. Epit.* 636. f.

N. alia minor alba. Dalech. Hist. 1010. f.

Frog-bit. *Petiv. H. Brit.* t. 71. f. 2.

In ditches, ponds, and slow streams. Rare in Scotland.

Perennial. *July*.

Root of many long, perpendicular, thread-shaped fibres, bearded towards the end with numerous radicles. *Leaves* stalked, heart-shaped, or kidney-shaped, rounded, obtuse; purplish underneath, mostly floating, not 2 inches broad. *Fl.* numerous, upright, very delicate, white, with a yellow central stain. Ray mentions, *Cant.* 101, a doubled-flowered, very sweet-scented, variety, as growing in his time plentifully in a ditch by the side of Audrey Causeway, in the isle of Ely, near the great wooden bridge; but Mr. Relhan sought it there in vain.



DIOECIA MONADELPHIA.

460. JUNIPERUS. Juniper.

Linn. Gen. 531. *Juss.* 413. *Fl. Br.* 1085. *Tourn. t.* 361. *Lam. t.* 829. *Gærtn. t.* 91.

Nat. Ord. *Coniferæ*. Linn. 51. *Juss.* 100.

Barr. fl. Catkin conical, with 3, or more, rows of whorled, imbricated, short, oval scales, 3 in each whorl, besides a terminal one. *Cor.* none. *Filam.* in the terminal floret 3, awl-shaped, united below; in the lateral ones scarcely

distinguishable. *Anth.* 3, of 2 roundish lobes; distinct in the terminal *floret*; in the rest adhering to the base of the scale.

Fert. fl. *Cal.* superior, in 3 minute, permanent segments, united with the germen. *Pet.* 3, rigid, acute, permanent. *Germ.* inferior, roundish. *Styles* 3, simple, very short. *Stigm.* simple. *Berry* succulent, roundish, marked in the lower part with 3 slight tubercles, originating in the points of the former calyx, now united to the fruit; and at the summit with 3 small teeth, formerly petals, surrounding the terminal depression. *Seeds* imbedded in the pulp, vertical, oblong, bony; convex at the outside; angular at the inner margin; their *skin* lodging several little cells of essential oil, or turpentine.

Evergreen aromatic *shrubs*, with narrow *leaves*, either spreading and sharp-pointed; or closely imbricated, minute, and obtuse. *Berries* globular or oval, black or brown, with a glaucous efflorescence.

1. *J. communis*. Common Juniper.

Leaves three in each whorl, tipped with a spine, spreading, longer than the ripe fruit. Stem erect.

J. communis. *Linn. Sp. Pl.* 1470, α . *Willd. v.* 4. 853. *Fl. Br.* 1085. *Engl. Bot. v.* 16. *t.* 1100. *Hook. Scot.* 290. *Woodv. t.* 95. *Mill. Illustr. t.* 95. *Ehrh. Pl. Off.* 449.

J. n. 1661, α . *Hall. Hist. v.* 2. 319.

J. vulgaris, *baccis parvis purpureis*. *Raii Syn.* 444. *Bauh. Hist. v.* 1. *p.* 2. 293. *f.*

J. vulgaris fruticosa. *Bauh. Pin.* 488.

Juniperus. *Ger. Em.* 1372. *f.* *Matth. Valgr. v.* 1. 109. *f.* *Camer. Epit.* 53. *f.* *Lob. Ic. v.* 2. 222. *f.*

J. minor. *Fuchs. Hist.* 78. *f.* *Ic.* 44. *f.* *Dalech. Hist.* 67. *f.*

On hills and heathy downs, especially where the soil is chalky.

Shrub. *May*.

Bushy, more or less erect, smooth in every part, with very numerous, spreading, subdivided, leafy, quadrangular *branches*. *Leaves* spreading, evergreen, 3 in each whorl, linear, straight, entire, with a fine sharp point; channelled and glaucous on the upper side; convex, keeled, and dark green, beneath; the edges sometimes roughish. *Fl.* axillary, sessile, small; the barren ones discharging a copious cloud of yellow *pollen*; fertile ones green, on scaly stalks. *Berries* scarcely more than half the length of the leaves, nearly globular, black with a blueish tint, their flavour sweetish, though with too much of a bitterish

turpentine flavour to be agreeable. They yield, by distillation, that curse of the common people, called Gin, whose substitutes or adulterations are more deadly than even itself. Various mountain birds feed on the berries of this and the following species, whence their flesh acquires a pitchy flavour. The medical qualities of these berries agree with those of the Fir tribe in general. Oil of Juniper affects the kidneys powerfully, and affords a temporary relief in nephritic colicks.

2. *J. nana*. Dwarf Alpine Juniper.

Leaves three in each whorl, tipped with a spine, somewhat imbricated, curved, the length of the oval ripe fruit. Stem recumbent.

J. nana. Willd. *Sp. Pl.* v. 4. 854.

J. communis β . *Fl. Br.* 1086. *Lightf.* 624.

J. communis γ . *Linn. Sp. Pl.* 1470.

J. n. 1661 δ . *Hall. Hist.* v. 2. 320.

J. alpina. *Raii Syn.* 444. *Bauh. Hist.* v. 1. p. 2. 301. f. 302. *Clus. Hist.* 38. f. *Pann.* 26. f. 25.

J. alpina minor. *Ger. Em.* 1372. f.

J. minor montana, folio latiore, fructuque longiore. *Bauh. Pin.* 489.

On mountains.

Upon Snowdon ; as well as on the mountains of Westmoreland.

Ray. On the Highland mountains of Scotland, frequent. *Light-foot*.

Shrub. *May*.

A dwarf shrub, with prostrate stems, and slightly ascending branches.

Leaves more or less curved, broader and shorter than the foregoing. Berries larger and more oval, nearly as long as the leaves.

All the old botanists reckoned this a distinct species ; but Linnæus and Haller, with their followers, have made it a variety. Willdenow has restored it to its former rank, but his specific character is rather feeble. Indeed the whole genus requires the same investigation that Mr. Lambert has bestowed upon *Pinus*, in order to determine how far this, and the beautiful trailing Sabine, as well as the great Swedish Juniper, require to be considered as distinct species, and on what their characters are to be founded.

461. *TAXUS*. Yew.

Linn. Gen. 532. *Juss.* 412. *Fl. Br.* 1086. *Tourn. t.* 362. *Lam. t.* 829. *Gærtn. t.* 91.

Nat. Ord. See n. 460.

Barr. fl. *Cal.* none. *Cor.* none. *Filam.* numerous, united in their lower part, forming a column, longer than the *bud*. *Anth.* depressed, in from 5 to 8 rounded segments, bursting at the base all round; subsequently becoming flat and peltate.

Fert. fl. *Cal.* minute, inferior, cup-shaped, entire; subsequently enlarged, tumid and succulent, permanent. *Cor.* none. *Germ.* superior, ovate, acute. *Style* none. *Stigma* obtuse. *Berry* spurious, formed of the enlarged, pulpy, coloured calyx, not united to the seed, except perhaps at the base. *Seed* 1, ovate-oblong, projecting beyond the enlarged calyx.

Evergreen *trees*, chiefly extraeuropæan, with numerous, mostly linear, entire *leaves*, slightly stalked, and axillary, solitary, somewhat stalked, *flowers*.

Linnæus, and some eminent botanists since his time, thought the pulpy part of the *fruit* was an enlarged *receptacle* rather than a *calyx*. The nature of this part is indeed peculiar, nor has it any affinity, as Linnæus supposed, to the *fruit* of *Gaultheria*.

1. *T. baccata*. Common Yew.

Leaves two-ranked, crowded, linear, flat. Receptacle of the barren flowers globular.

T. baccata. Linn. *Sp. Pl.* 1472. Willd. *v.* 4. 856. *Fl. Br.* 1086. *Engl. Bot.* *v.* 11. *t.* 746. Hook. *Scot.* 290. *Lightf.* 626. *Fl. Dan.* *t.* 1240. Bull. *Fr.* *t.* 136. Dicks. *H. Sicc. fasc.* 16. 6. Ehrh. *Arb.* 50. *T. n.* 1663. Hall. *Hist.* *v.* 2. 322.

Taxus. Raii *Syn.* 445. Ger. *Em.* 1370. *f.* Bauh. *Hist.* *v.* 1. *p.* 2. 241. *f.* Matth. *Valgr.* *v.* 2. 444. *f.* Camer. *Epit.* 840. *f.*

In mountainous woods, and on the ledges of limestone cliffs.

Tree. March, April.

Trunk straight, variously channelled longitudinally, with a smooth deciduous *bark*; and horizontal *branches*, spreading in opposite directions. *Leaves* scattered, nearly sessile, two-ranked, linear, entire, very slightly revolute, about an inch long; dark-green, smooth and shining above; paler, with a prominent mid-rib, beneath, terminating in a small harmless point. *Fl.* axillary, solitary, each from a scaly imbricated *bud*; the barren ones light-brown, white with abundant *pollen*; fertile green, resembling, with their scaly *bracteas*, a little acorn. *Fruit* drooping, consisting of a sweet, internally glutinous, scarlet *berry*, open at the top, enclosing an oval brown *seed*, unconnected with the fleshy part.

The *wood*, being of extremely slow growth, is hard and tough, formerly highly valuable for making bows, but now chiefly used for fine cabinet work, or inlaying. It makes handsomer chairs than many expensive exotic woods. The *leaves* are fetid, and very poisonous, and prove speedily fatal to cattle, accidentally tasting them, when young and tender. The *berries* have a sweet mawkish taste, and may be eaten without danger.

I have seen, in Mr. Bannerman's nursery near Liverpool, an upright-branched variety of the Yew, with larger *leaves*, a little curved downwards, and spreading almost equally every way. This was brought from Ireland.

Class XXIII. POLYGAMIA.

Stamens and Pistils united in the same flower, besides others in separate flowers, having a different structure in their accessory parts, on the same or different plants.

Order I. MONOECIA. *Flowers different on the same plant.*

462. ATRIPLEX. *United fl. Cal. inferior, in 5 deep segments. Cor. none. Stam. 5. Style deeply cloven. Seed 1, depressed.*

Fert. fl. Cal. inferior, in 2 deep segments. Cor. none. Style deeply cloven. Seed 1, compressed.



POLYGAMIA MONOECIA.

462. ATRIPLEX. Orache.

Linn. Gen. 745. Juss. 85. Fl. Br. 1090. Tourn. t. 286. Lam. t. 850. Gærtn. t. 75.

Nat. Ord. Holeraceæ. Linn. 12. Atriplices. Juss. 29. Chenopodeæ. DeCand. 100. Br. Prodr. 405. Next akin to Chenopodium. v. 2. 9.

United fl. Cal. inferior, concave, permanent, in 5 deep, equal, ovate, concave segments, thin or membranous at the edges. Cor. none. Filam. 5, awl-shaped, from the bottom of the calyx, opposite to its segments, and about as long. Anth. of 2 round lobes. Germ. superior, orbicular, often very imperfect. Style short, deeply divided. Stigmas simple, spreading. Seed 1, orbicular, depressed, wrapped in a thin close pellicle, and covered by the closed, permanent, 5-angled calyx. Our British species scarcely form any seed in these flowers.

Fert. fl. on the same plant. *Cal.* inferior, in 2 deep, large, flat, erect, compressed, ovate, bluntish segments. *Cor.* none. *Stam.* none. *Germ.* superior, compressed. *Style* short, deeply divided. *Stigmas* simple, spreading. *Seed* 1, orbicular, compressed, wrapped in a thin close pellicle, and enclosed between the enlarged, converging, heart-shaped valves of the calyx.

Herbaceous or shrubby, perennial or annual, branched, mostly upright. *Leaves* simple, undivided or jagged. *Pubescence* scaly, or mealy. *Stipulas* none. *Fl.* numerous, small, greenish, in tufted *spikes*, or axillary and aggregate. *Seeds* blackish, or brown. *Stam.* certainly opposite to the *calyx*, not alternate with its segments.

1. *A. portulacoides*. Shrubby Orache, or Sea Purslane.

Stem shrubby, spreading. Leaves opposite, obovate-lanceolate, entire; tapering at the base. Flowers generally completely separated.

A. portulacoides. Linn. *Sp. Pl.* 1493. Willd. *v.* 4. 957. *Fl. Br.* 1090. *Engl. Bot.* *v.* 4. *t.* 261. Hook. *Scot.* 291. Bertolon. *Am. Ital.* 244.

A. maritima fruticosa, Halimus et *Portulaca marina dicta*, angustifolia. Raii *Syn.* 153.

Halimus seu *Portulaca marina*. Bauh. *Pin.* 120.

H. vulgaris. Ger. *Em.* 523. *f.* Matth. *Valgr.* *v.* 1. 145. *f.*

H. secundus. Clus. *Hist.* 54. *f.*

Portulaca marina. Dalech. *Hist.* 552. *f.*

P. marina fruticosa, quæ Halimus, secundus Clusii. Bauh. *Hist.* *v.* 1. *p.* 2. 228. *f.* 229.

Sea Purslane. Petiv. *H. Brit.* *t.* 7. *f.* 7.

On the muddy sea coast frequent.

Shrub. July, August.

Root woody, somewhat creeping, much branched at the crown. Stems 12 or 18 inches high, shrubby, branched, leafy, ascending, or sometimes procumbent, hoary; round below; quadrangular above. Leaves opposite, stalked, leathery, bluntish, entire; tapering at the base into a channelled footstalk; hoary or mealy all over. Spikes about the top of each branch, axillary and terminal, erect, interrupted, consisting of several little sessile tufts, of reddish-green mealy flowers, some with yellow heart-shaped anthers, and seldom any pistil; others with reddish styles, and no traces of stamens. Cal. of the fruit, of the latter, slightly enlarged, lobed, a little tumid.

The whole plant abounds with fossil alkali, or Soda. Its silvery glaucous hue is remarkable, and not inelegant.

2. *A. laciniata*. Frosted Sea Orache.

Stem herbaceous, spreading. Leaves trowel-shaped, angular and toothed; scaly beneath.

A. laciniata. *Linn. Sp. Pl.* 1494. *Willd. v.* 4. 963. *Fl. Br.* 1090. *Engl. Bot. v.* 3. *t.* 165. *Dicks. H. Sicc. fasc.* 4. 15. *Fl. Dan. t.* 1284.

A. maritima. *Raii Syn.* 152. *Bauh. Hist. v.* 2. 974. *f.*

A. marina. *Ger. Em.* 325. *f.* *Matth. Valgr. v.* 1. 421. *f.* *Camer. Epit.* 244. *f.* *Dalech. Hist.* 537. *f.*

A. marina repens. *Lob. Ic.* 255. *f.*

Frosty Sea Orrach. *Petiv. H. Brit. t.* 7. *f.* 3.

β . *Atriplex maritima nostras procerior, foliis angulosis incanis, admodum sinuatis. Pluk. Almag.* 60. *Dill. in Raii Syn.* 152.

On the sandy sea coast, but not common.

In Essex. *Ray*. At Harwich. *Mr. Francis Smith*. On the shore at Leith, and New Haven, near Edinburgh.

Annual. *July*.

Root tapering. *Herb* clothed, more or less, with silvery scales.

Stems usually several, spreading, or recumbent, alternately branched, roundish, leafy, often tinged with red. *Leaves* alternate, stalked, deltoid, or somewhat rhomboid, obscurely three-lobed, coarsely toothed, or jagged; the base entire. United *flowers* in dense, terminal, lobed *spikes*; their *germens* for the most part abortive. Fertile ones axillary, stalked, several together; their *calyx* gradually very much enlarged, triangular, toothed, or lobed, powdery, ribbed, and veiny. *Seed* compressed, smooth, brownish.

β is a doubtful plant, which has never fallen in my way.

3. *A. patula*. Spreading Halberd-leaved Orache.

Stem herbaceous, spreading. Leaves triangular-lanceolate, somewhat halberd-shaped. Calyx of the fruit tuberculated at the sides.

A. patula. *Linn. Sp. Pl.* 1494. *Willd. v.* 4. 964. *Fl. Br.* 1091. *Engl. Bot. v.* 13. *t.* 936. *Hook. Scot.* 291.

A. hastata. *Huds.* 443. *Lightf.* 636. *Curt. Lond. fasc.* 2. *t.* 66.

A. n. 1617. *Hall. Hist. v.* 2. 289.

A. sylvestris, folio hastato seu deltoide. Raii Syn. ed. 2. 62. *ed.* 3. 151.

A. sylvestris annua, folio deltoide triangulari sinuato et mucronato, hastæ cuspidi simili. Moris. v. 2. 607. *sect.* 5. *t.* 32. *f.* 14.

A. sylvestris vulgaris. Ger. Em. 326. *f.*

A. sylvestris secunda. Matth. Valgr. v. 1. 419. *f.* *Camer. Epit.* 242. *f.* *Dalech. Hist.* 536. *f.*

A. sylvestris sinuata. Lob. Ic. 254. *f.*

Delt Orrach. *Petiv. H. Brit. t.* 7. *f.* 1.

β . *Atriplex maritima* perennis, folio deltoide, seu triangulari, minùs incano. *Moris. v. 2. 607. Raii Syn. 152.*

γ . *A. maritima*, ad foliorum basin velùt auriculata, procumbens, et ne vix sinuata. *Pluk. Almag. 61. Dill. in Raii Syn. 152.*

A. marinæ species Valerando. *Bauh. Hist. v. 2. 974. f. Chabr. Ic. 306. f. 4.*

Delt Sea Orrach. *Petiv. II. Brit. t. 7. f. 2.*

In cultivated as well as waste ground, and on dunghills, common. β and γ . By the sea side, or in salt marshes.

Annual. *June—August.*

Root fibrous, certainly annual in all the varieties, more slender than in *A. laciniata*. *Stem* most commonly erect, with long, spreading *branches*; the herbage of a dull green, slightly mealy; but in β and γ the whole plant is procumbent, more glaucous, often reddish, and somewhat fleshy. *Leaves* alternate, on long stalks, most powdery at the back; the lower ones halberd-shaped, having two large, acute, spreading lobes at the base, with many very unequal, sharp, scattered teeth, between them and the point; the base quite entire; upper ones gradually narrower, with smaller lobes or none at all, so that the floral ones are perfectly lanceolate, as well as entire. *Spikes* terminal and axillary, long, erect, interrupted, the *flowers* in little round dense tufts. The bivalve *calyx* of the fertile ones is armed at both sides with several prominent acute tubercles, or prickles. In these alone *seed* is produced, which is finely dotted, twice as large as that of the following species.

Linnaeus misled our British botanists by referring Morison's synonym of this plant to his *A. hastata*; whereas his own herbarium and definitions prove it to be his *patula*; the real *hastata*, not known in Britain, differing widely, in the large, reticulated, sinuated valves of the fruit-bearing *calyx*, whose long teeth terminate in bristly points.

Our β is declared by Doody, in *Raii Syn. ed. 2. 341*, to be annual, not perennial, and therefore, perhaps, is hardly to be known at all from the common sort. I have never met with any thing answerable to this. γ often occurs on sandy ground by the sea. It is prostrate, more glaucous and fleshy, with a frequent tinge of red, and smaller, less toothed, or quite entire, *leaves*, differing from its natural inland habit, as many other plants, in maritime situations, often do.

4. *A. angustifolia*. Spreading Narrow-leaved Orache.

Stem herbaceous, spreading. *Leaves* lanceolate, entire; the lower ones partly three-lobed. *Calyx* of the fruit halberd-shaped, slightly warty at the sides.

A. angustifolia. Fl. Br. 1092. Engl. Bot. v. 25. t. 1774. Willd. Sp. Pl. v. 4. 965. Hook. Scot. 291.

A. patula. *Huds.* 443. *With.* 275. *Lightf.* 637.

A. n. 1616. *Hall. Hist.* v. 2. 289.

A. sylvestris angustifolia. *Raii Syn.* 151. *Ger. Em.* 326. *f.*

A. sylvestris, polygoni aut helxines foliis. *Lob. Ic.* 257. *f.*

A. sylvestris humillima. *Dod. Pempt.* 615. *f.*

A. sylvestris prima. *Matth. Valgr.* v. 1. 418. *f.* *Dalech. Hist.* 536. *f.*

A. vulgaris angustifolia. *Bauh. Hist.* v. 2. 973. *f, f.*

A. angusto oblongo folio. *Bauh. Pin.* 219 ; with some wrong synonyms.

Spear Orrach. *Petiv. H. Brit.* t. 7. *f.* 5.

Common in cultivated and waste ground.

Annual. *June—August*.

This has the general habit, and dull, greyish-green, hue of the preceding, of which Haller was disposed to think it a variety, and to which Linnæus referred some of its indubitable synonyms. Dr. Hooker is of the same opinion as Haller, and perhaps Linnæus, though the latter has left no specimen to decide the question. Ray kept them separate, though even his opinion was disputed. Most British botanists have concurred with this great practical observer, and there are some circumstances which seem favourable to their opinion. The *branches* spread more widely than even in *A. patula* ; the *leaves* are uniformly lanceolate and entire, never toothed ; a very few of the lowermost indeed have occasionally an ascending lobe at each side, but their base is tapering, not straight or horizontal, like the true halberd-shaped *leaves* of the last, nor are they sinuated or toothed. The valves of the seed-bearing *calyx* are hastate, with an elongated acute point ; their margins entire, their disk either quite smooth, or besprinkled with only a few warts. Ripe *seed* but half the size of *A. patula*, and very slightly, if at all, dotted ; circumstances which prove of material importance in the nearly allied genus *Chenopodium*, but which I believe have been nowhere noticed in *Atriplex*, except in the *Fl. Britannica*. Haller remarks that the stamiferous *flowers* of the present plant are for the most part four-cleft.

5. *A. erecta*. Upright Spear-leaved Orache.

Stem herbaceous, erect. Leaves ovate-lanceolate ; lower ones sinuated. Calyx of the fruit all over armed with sharp tubercles.

A. erecta. *Huds. ed.* 1. 376. *Fl. Br.* 1093. *Engl. Bot.* v. 31. t. 2223. *Willd.* v. 4. 965.

A. patula β . *Huds. ed.* 2. 444.

A. angustifolia laciniata. *Dill. in Raii Syn.* 152.

A. angustifolia dentata. *Raii Hist.* v. 1. 192 ; omitting the syn. of *J. Bauhin*.

In waste ground, very rare.

On the entrance into Battersea field, from Nine Elms. *Prof. Martyn, sen.* In Mr. Rose's herbarium, probably from Mr. Hudson ; or at least named by his authority.

Annual. *August*.

Stem quite erect, firm, with many upright leafy *branches* ; paniced and clustered at the top. *Leaves* alternate, stalked, ovate-lanceolate, acute, slightly powdery or scaly ; the uppermost gradually narrower, linear-lanceolate and entire ; lower ones toothed or sinuated, running down at the base into a bordered *footstalk*. *Clusters* terminal, erect, compound, many-flowered ; leafless in the upper part. *Fl.* in short, dense, rather oblong, heads, or blunt spikes. Valves of the seed-bearing *calyx* only one third the size of the last, deltoid, acute, tumid ; toothed at the edges ; the disk of both valves beset with numerous, prominent, strong, acute warts, or teeth. *Seed* orbicular, blackish, like the preceding, but smaller.

The very copious, small, strongly armed *fruit* readily distinguishes this plant, and confirms the characters founded on the same parts in the two foregoing species.

6. *A. littoralis*. Grass leaved Sea Orache.

Stem herbaceous, erect. *Leaves* all linear, entire, variously toothed, or sinuated. *Calyx* of the fruit sinuated ; its disk armed with prominent tubercles.

A. littoralis. *Linn. Sp. Pl.* 1494. *Willd. v.* 4. 965. *Fl. Br.* 1094. *Engl. Bot. v.* 10. *t.* 708. *Hook. Scot.* 291. *Don H. Br.* 142.

A. maritima, scopariæ folio. *Dill. in Raii Syn.* 153.

A. minima angustifolia maritima. *Bocc. Sic.* 29. *t.* 15. *f.* 1. *Moris. v.* 2. 607. *sect.* 5. *t.* 32. *f.* 20.

A. angustissimo et longissimo folio. *Dill. in Raii Syn.* 153.

A. maritima angustifolia, obtusiore folio. *Dill. in Raii Syn.* 153.

Grass Sea Orrach. *Petiv. H. Brit. t.* 7. *f.* 6.

β. *Atriplex, serrata*. *Huds. ed.* 1. 377. *ed.* 2. 444.

A. marina. *Linn. Mant.* 300.

A. angustifolia maritima dentata. *Raii Syn.* 152.

A. angustifolia laciniata minor. *Bauh. Hist. v.* 2. 972. *f.* 973.

Jagged Long Orrach. *Petiv. H. Brit. t.* 7. *f.* 4.

In muddy salt-marshes, chiefly on the eastern coast.

Annual. *August, September*.

Root fibrous. *Stem* erect, from one to two feet, or more, in height, leafy, angular, smooth, with upright, alternate, *branches*. *Leaves* alternate, stalked, slightly spreading, linear-oblong, from two to four inches in length, smooth, somewhat fleshy, either quite entire, or more or less toothed and jagged, turning black in drying, from the abundance of alkaline or marine salt which they

contain ; the under side, like the young branches, mealy, or hoary. *Spikes* erect, obtuse, interrupted, beset with small leaves in the lower part. *Fl.* numerous, in little dense heads ; those furnished with *stamens* having scarcely any rudiments of a *germen*. Valves of the seed-bearing *calyx* ovate, acute, deeply sinuated at the margin ; the disk covered with large, prominent, sharp tubercles. *Seed* rather pointed, compressed.

What gives a spiral appearance to the *seed* of this and other species of *Atriplex*, as described in *Fl. Br.* or *Engl. Bot.*, is the convoluted form of the *embryo*, surrounding the *cotyledons*, which are themselves flat and straight.

7. *A. pedunculata*. Stalked Sea Orache.

Stem herbaceous, zigzag, with spreading branches. Leaves obovate, entire. Seed-bearing flowers stalked, wedge-shaped.

A. pedunculata. *Linn. Sp. Pl.* 1675. *Willd. v. 4.* 966. *Fl. Br.* 1095. *Engl. Bot. v. 4. t. 232.* *Dicks. H. Sicc. fasc. 6. 7.*

A. marina, semine lato. *How Phyt.* 13. *Raii Syn.* 153.

A. maritima, Halimus dicta, erecta, semine foliiculis membranaceis bivalvibus, in latitudinem porrectis, et utrinque recurvis, longo pedunculo insidentibus, elauso. *Pluk. Almag.* 61. *Phyt. t. 36. f. 1.*

Ceratocarpus salinus. *Pallas's Travels, v. 1.* 291.

Heart Sea Purslain. *Petiv. H. Brit. t. 7. f. 8.*

β . *Atriplex maritima nostras*, *Oeimi minoris folio*. *Raii Syn.* 153.

On the sea coast, in muddy places, salt marshes, &c.

Near Boston and Lynn. *Plukenet*. Plentifully in the isle of Thanet, near the ferry. *J. Sherard*. On the east bank of the Ouse, just below Lynn, 1778 ; also at Yarmouth.

Annual. *August, September.*

Root tapering. *Herb* greyish, all over scaly ; tawny in decay. *Stem* erect, or reclining, from three to twelve inches high, commonly branched and bushy, zigzag, leafy, angular. *Leaves* alternate, obovate, obtuse, entire, leathery or fleshy, tapering down into short *footstalks*. The *flowers* with *stamens* have no traces of a *pistil* ; the fertile ones, intermixed with them, and at first likewise sessile, are subsequently elevated on simple *stalks*, half an inch, or near an inch, long, becoming enlarged, wedge-shaped, compressed, with two blunt spreading lobes, and enclosing a flat orbicular *seed*. In this state the plant is easily recognized.

The small variety, β , more dwarfish and depressed, is less uncommon on our eastern coast than the more flourishing and luxuriant state of the plant.

Class XXIV. CRYPTOGAMIA.

Stamens and Pistils either imperfectly, or not at all, known, or not to be numbered with any precision.

[*The Orders are all natural families, and all either monocotyledonous or acotyledonous.*]

Order I. FILICES. Ferns.

Frond with either dorsal, terminal, axillary, or radical fructification.

** Capsules aggregate, on the back of a leafy frond, bivalve, each bound with an elastic jointed ring, contrary to the valves.*

- 463. POLYPODIUM. *Capsules in roundish scattered masses. Cover none.*
- 464. ASPIDIUM. *Caps. in roundish scattered masses. Cover nearly orbicular, fixed by the centre, separating all round.*
- 465. CYSTEA. *Caps. in roundish scattered masses. Cover orbicular, concave, fixed by a lateral point underneath, finally reflexed and jagged.*
- 471. WOODSIA. *Caps. in roundish scattered masses. Cover roundish, fixed by a central stalk under each mass; the margin in numerous, deep, capillary, incurved segments.*
- 466. ASPLENIUM. *Caps. in linear, scattered masses. Cover linear, separating at the side towards a mid-rib or vein.*
- 467. SCOLOPENDRIUM. *Caps. in nearly linear, twin, scattered masses, between 2 parallel veins. Covers 2, linear, opposite, folding over each other.*

468. BLECHNUM. *Caps.* in linear, solitary *masses*, close to the midrib. *Cover* linear, flat, separating towards the rib.
469. PTERIS. *Caps.* in linear, nearly marginal *masses*. *Cover* from the inflexed margin of the *frond*, wavy, continuous, separating at its inner edge.
470. ADIANTUM. *Caps.* on the back of each rounded, reflexed, marginal, distinct *cover*, in small, roundish, central *masses*.
472. TRICHOMANES. *Caps.* in oblong *masses*, imbedded in the edge of the *frond*. *Cover* marginal, pitcher-shaped, of one leaf, opening outwards.
473. HYMENOPHYLLUM. *Caps.* in roundish *masses*, imbedded in the edge of the *frond*. *Cover* marginal, compressed, of two valves, opening outwards.
- ** *Capsules, or seeds, without any distinct elastic ring.*
478. EUISETUM. *Catkins* terminal. *Seeds* separately embraced by 4 spiral *filaments*, presumed to bear *pollen*.
476. OPHIOGLOSSUM. *Spike* 2-ranked. *Capsules* bivalve, imbedded.
474. OSMUNDA. *Cluster* branched. *Caps.* stalked, naked, globular, with a striated protuberance.
475. BOTRYCHIUM. *Common stalk* compound, flattened. *Caps.* sessile, naked, globular, simple.
477. LYCOPODIUM. *Caps.* axillary, solitary, compressed.
479. PILULARIA. *Common receptacle* of 4 cells, concealing numerous barren and fertile *florets*. *Seeds* coated.
480. ISOETES. *Comm. recept.* of 1 cell, within the base of the *frond*. *Seeds* rough.

CRYPTOGAMIA FILICES.

* *Dorsifera*.

The Dorsal Ferns, a perfectly natural and most elegant family, compose the first section of this Order. The early writers, as well as Linnæus and Jussien, have comprehended under the denomination of *Filices*, various plants which are not *dorsifera*, but which have some points of agreement with those that are so. They constitute however a separate section.

Filices dorsifera, Dorsal Ferns, composing our first section, consist individually of a *frond*, or *leaf* bearing the *fructification*, on its under side, or back, either in some part of the disk, or close to the margin, or to the common, or to the partial, midrib. Of the *barren flowers*, or *stamens*, nothing satisfactory has yet been ascertained. The *fertile ones* in their origin are so minute and obscure that nothing of their structure is known. They first become visible in the form of *seed-vessels*, containing very numerous and very minute *seeds*, proved to be such by their germinating like those of other plants. I see no advantage in applying a new denomination to the seeds of these and other cryptogamic plants. Hedwig gave the Greek name *spora* to the seeds of Mosses, because he conceived them to differ in their structure and germination, in some indefinite manner, from seeds in general. The most malicious rival of his immortal fame could not have imagined any thing more subversive of that fame, or of his luminous discoveries. He proved, beyond a doubt, what others had only supposed, the impregnation of the seeds of Mosses, by means of genuine barren flowers and their *pollen*. This fact is now as well confirmed and established as the impregnation of any other plants; of the Hollyhock for instance, of which a young Swiss, in my time, thought he had obtained good seeds without the aid of stamens. If therefore Hedwig established the production of perfect vegetative seeds in the usual way, in the natural order of *Musci*, he on the other hand overturned his own discovery, by allowing these seeds to be termed *spora*. For a long time indeed, in all his writings, he called them *semina*; nor is it worth inquiring how he came to alter that established term, which

Willdenow and Brown still retain. This is not merely a dispute of words. If the bodies in question are not really *seeds*, the offspring of impregnation, they are *gemmæ*, buds or offsets. In the former instance, they propagate the plant, with its appropriate indestructible characters and qualities; in the latter they only increase or extend an individual, with whatever characters or properties any variety from which they are taken may possess. Their impregnation however is proved, and their germination well understood. The branching jointed fibres, which they in the first instance send forth, have been taken for *cotyledons*, but prove to be *radicles*, exactly the same as the whole vegetable body in Mosses, or any portion of it, is so very prone to produce. Even a fragment of the *receptacle* of the *anthers* has been found to throw out such fibres, which led to a mistaken idea of their originating in the *anthers* themselves. I am surprised that the impregnation of *Musci* should, after Hedwig's correct demonstration of all the parts concerned, and their separate functions, still be contradicted, though it cannot be disproved. I humbly conceive it would be as idle to institute experiments to prove the generation of Mosses, as of Hollyhocks, or any other plants. But let those who doubt the fact make such experiments; at least before they hazard unfounded suppositions.

The production of perfect germinating *seeds*, contained in *capsules*, and consequently produced by impregnated *fertile flowers*, is as clear in Ferns as in Mosses, though nothing is certainly known of their *stigmas*, any more than of their *anthers*. We are nevertheless content to plead ignorance on the subject, and to presume, by analogy, that such parts may exist, rather than to assume the idea of some other mode of impregnation, hitherto unknown, which would be going contrary to the first principles of philosophy; or, what is worse, returning to the old gratuitous fancies of spontaneous generation.

The genera of Dorsal Ferns have been founded on different characters by different writers. Ray, Tournefort, Plumier, and other early systematic botanists, resorted, in the first instance, to the shape of the *frond*, than which nothing is more vague, unnatural, or uncertain as a generic distinction. Linnæus and his followers have trusted to the shape of the *masses* of *capsules*, whether round, oblong, linear, or indeterminate, whence far bet-

ter characters are obtained, but not such as prove sufficient. The writer of this, furnished with a vast collection of Ferns in the Linnæan herbarium, and from that of Sir Joseph Banks, first suggested an additional principle of arrangement, derived from the form and insertion of the membranous *cover*, or *involucrum*, and especially from the direction in which that part bursts, or separates from the *frond*, when arrived at maturity; whether, if lateral, at the side towards the margin of the *frond*, or of its segments, or towards the rib or vein; or, if terminal, towards the extremity, or contrariwise. This principle is found to produce very certain distinctions, and to establish the most natural genera. All subsequent writers on Ferns have adopted it. First, Dr. Swartz, in his *Synopsis Filicum*, considers the part in question as of eminent importance in defining the genera, and has established several new ones on characters taken therefrom; bestowing liberal commendation, in the 5th page of his preface, on his friend the inventor of this method. Willdenow in his *Species Plantarum*, vol. v., follows it without a word of acknowledgement, as does Dr. Kurt Sprengel in a rather superficial work, scarcely worthy of its able author, translated into English by Mr. König, under the title of *An Introduction to the Study of Cryptogamous Plants*, 1807; the figures of which are quoted in the following pages, and will be found very useful in the illustration of other vegetables of this class. But whatever deficiency of candour or knowledge may exist in other writers, Mr. Brown, in establishing the curious genus *Woodsia*, has done ample justice to his friend's claims, which no one was more competent to appreciate. See *Trans. of Linn. Soc.* v. 11. 170.

The *roots* of Dorsiferous Ferns are perennial, either tuberos or creeping, scaly, often parasitical, with crooked stout *radicles*. *Plants* mostly herbaceous, natives of shady or damp situations, in almost all climates, either evergreen or deciduous; those of tropical countries sometimes arborescent, and occasionally spinous; the *pubescence* of all, in general, scaly rather than hairy. *Frond* with a simple or alternately branching *stalk*; the *leaf* either firm or more rarely membranous, ribbed, veiny, palest in some degree at the back; either simple or variously pinnate; undivided, pinnatifid, or lobed; the divisions mostly alternate; entire or serrated; bearing the *fructi-*

fication at the back, very seldom at the edges, as above described. The membranous *cover*, or *involucrum*, which protects the *masses* of *capsules* till they arrive at maturity, originates either from the surface of the *frond*, when it is termed superficial; or terminates a rib, vein, or segment; or is laterally inserted, by one of its margins, into a vein or rib, the opposite margin being closely pressed, if not in any degree attached, to the cuticle of the leaf.

It is remarkable that insects scarcely ever feed on dried specimens of Ferns.

463. POLYPODIUM. Polypody.

Linn. Gen. 560. Juss. 15. Fl. Br. 1113. Sm. in Act. Taurin. v. 5. 408. Tracts 231. sect. 1. Swartz. Syn. Fil. 25. Br. Prodr. 146. Tourn. t. 316. Lam. t. 866.

Nat. Ord. Filices. Linn. 55. Juss. 5. Br. Prodr. 145.

Masses of *capsules* nearly orbicular, convex, scattered over the back of the *frond*, in rows, between the midrib of each lobe and the margin, without any membranous *cover*. *Capsules* very numerous, globose, on capillary stalks; each of 1 cell, and 2 equal, hemispherical valves, bound together by a transverse, jointed *ring*, which finally, when dry, separates them by its elasticity. *Seeds* numerous, roundish, very minute.

Herbaceous, or perhaps arborescent. *Root* creeping, often scaly. *Fronde* erect, simple or variously pinnate, more or less compound; undivided, or mostly pinnatifid; entire or serrated; of a firm texture, generally smooth. *Caps.* tawny. Natives of almost every climate.

* *Frond pinnatifid.*

1. *P. vulgare.* Common Polypody.

Frond deeply pinnatifid; lobes oblong, somewhat serrated, obtuse. Root scaly.

P. vulgare. Linn. Sp. Pl. 1544. Willd. v. 5. 172. Fl. Br. 1113. Engl. Bot. v. 16. t. 1149. Hook. Scot. p. 2. 153. Curt. Lond. fasc. 1. t. 68. Woodv. suppl. t. 271. Bolt. Fil. 32. t. 18. Fl. Dan. t. 1060. Bull. Fr. t. 191. Ehrh. Crypt. 121. Bauh. Pin. 359. Plum. Fil. pref. 27. t. A. f. 2. Moris. v. 3. 562. sect. 14. t. 2. f. 1. P. n. 1696. Hall. Hist. v. 3. 11.

Polypodium. Raii Syn. 117. Ger. Em. 1132. f. 1, 2. Trag. Hist. 540. f. Cord. Hist. 171. 2. f. Fuchs. Hist. 588. f. Ic. 338. f.

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Matth. Valgr. v. 2. 628, 629. f, f. Camer. Epit. 993. f. Tillands Ic. 79. f.

P. primum Matthioli. *Dalech. Hist. 1229. f.*

β . *P. murale*, pinnulis serratis. *Dill. in Raii Syn. 117.*

P. majus, serrato folio. *Barrel. Ic. t. 38.*

γ . *P. vulgare*, lobis proliferis. *Bolt. Fil. 33. t. 2. f. 5. b.*

δ . *P. cambricum*. *Linn. Sp. Pl. 1546. Bolt. Fil. t. 2. f. 5. a.*

P. cambrobritannicum, pinnulis ad margines laciniatis. *Raii Syn. 117.*

P. cambrobritannicum, lobis foliorum profundè dentatis. *Moris. v. 3. 563. sect. 14. t. 2. f. 8.*

Filix amplissima, lobis foliorum laciniatis, cambrica. *Pluk. Almag. 153. Phyt. t. 30. f. 1.*

On walls, cottage roofs, shady banks, and trunks of old trees.

α and β , very common. γ . In a wood near Bingley. *Dr. Alexander.* At Chepstow, Monmouthshire. δ . In many parts of North Wales occasionally, without fructification. *Ray. Mr. Griffith, and Rev. H. Davies.* With copious fructification, in a wood by the Dargle, County of Wicklow, Ireland. *Mr. J. T. Mackay.*

Perennial. *May—October.*

Root creeping horizontally, with numerous, stout, branched fibres, somewhat woody, twisted, densely clothed with membranous, brown, linear, serrated, taper-pointed, shining scales. *Fron*d from eight to twelve or fourteen inches high, linear-lanceolate, deeply pinnatifid, often nearly to the main rib, with numerous, parallel, slightly distant, linear-oblong, obtuse, flat segments; seldom perfectly entire throughout; often wavy, or serrated, especially about the ends; in γ forked, or partly three-cleft, with acute spreading lobes; in δ doubly pinnatifid, as well as variously toothed and serrated, the segments either obtuse, or taper-pointed, the whole *frond* elegantly imitating an ostrich feather, whence doubtless originated the name of *Polypodium plumosum*, for which Ray could not account. In Wales this variety has always been found without fructification; but I have two Irish specimens, partly almost covered with masses of *capsules*, like the common kind. These *masses* are alike in all the varieties, each originating in a naked, depressed, scarcely visible spot, destitute of any cover, gradually becoming an orbicular convex *mass*, or assemblage, a line in diameter, consisting of fifty or sixty globular, shining, tawny *capsules*, which when ripe and dry, burst on the application of moisture to their jointed rings, and scatter in abundance their exquisitely minute *seeds*. Tournefort, though usually very accurate, denies the existence of a ring in his genus *Polypodium*, which Adanson copies. The *masses*, at an advanced period, become crowded and confluent. The common *stalk* of the *frond* is, in all the varieties, naked and smooth.

** *Fronde doubly pinnatifid.*

2. *P. Phegopteris*. Pale Mountain Polypody.

Fronde pinnate; leaflets lanceolate, united at the base, pinnatifid, with blunt segments; the lowest pair deflexed. Ribs and veins hairy. Masses of capsules towards the margin of each segment.

P. Phegopteris. Linn. *Sp. Pl.* 1550. Willd. *v.* 5. 199. *Fl. Br.* 1116. *Engl. Bot.* *v.* 31. *t.* 2224. Hook. *Scot.* *p.* 2. 153. *Bolt. Fil.* 36. *t.* 20. *Fl. Dan.* *t.* 1241. Ehrh. *Crypt.* 131.

P. n. 1698. Hall. *Hist.* *v.* 3. 12.

Filix minor britannica, *pediculo pallidiore*, *alis inferioribus deorsum speetantibus*. Moris. *v.* 3. 575. *sect.* 14. *t.* 4. *f.* 17. Dill. in *Raii Syn.* 122.

In the clefts of rocks, in moist mountainous situations; sometimes on open stony moors, in the north of England and south of Scotland.

In several parts of Westmoreland, but not very common.

Perennial. *June, July.*

Root thread-shaped, slender, wavy, creeping widely, slightly scaly.

Fronde scattered, erect, twelve or eighteen inches high, delicate in texture, of a pale green, minutely hairy. *Stalk* brittle, pale, slender, sometimes a little scaly, longer than the leafy part of the *frond*, whose outline is triangular, tapering to a long slender point. *Leaflets* opposite; two lower most deflexed; about ten or twelve pair of them pinnatifid, broad and united at the base; the rest about as many, undivided and entire, composing the pinnatifid, taper-pointed, summit of the *frond*. Segments all blunt, wavy, somewhat erenate, or entire, finely hairy, often fringed; the midrib most hairy; the hairs in various parts often aggregate, or starry; some of them flat, like narrow membranous scales. *Masses of capsules* naked, very small, of a pale yellowish brown, disposed in short imperfect rows, towards the margins of the base of each segment. *Caps.* pellucid, pale, with brown rings, much fewer together than in the former species.

The name of *Phegopteris*, or Beech Fern, is by no means suitable to this species, which does not grow in Beech woods, but in stony mountainous places. The two lowest branches, or leaflets, being more or less bent downward, sometimes as it were pendulous, are peculiarly characteristic.

*** *Fronde more than twice compounded.*

3. *P. Dryopteris*. Tender Three-branched Polypody.

Fronde three-branched; branches doubly pinnate, spreading rather downwards; segments obtuse, somewhat cre-

nate. Root thread-shaped. Masses of capsules scattered, distinct.

P. Dryopteris. *Linn. Sp. Pl.* 1555. *Willd. v. 5.* 209. *Fl. Br.* 1116. *Engl. Bot. v. 9. t. 616*; omitting the reference to *Dickson. Hook. Scot. p. 2.* 153. *Bolt. Fil. 52. t. 28.* *Purt. v. 2.* 505. *Ehrh. Crypt.* 102.

P. n. 1699. *Hall. Hist. v. 3.* 12.

Filix ramosa minor. *Raii Syn.* 125. *Bauh. Hist. v. 3.* 733. *f.*

F. saxatilis ramosa, nigris maculis punctata. *Moris. v. 3.* 585. *sect. 14. t. 4. f.* 19.

F. arborea. *Trag. Hist.* 538. *f. good.* *Dalech. Hist.* 1225. *f.*

Filicula petræa fœmina quarta. *Tabern. Kreuterb.* 1182. *f.*

Pteridion fœmina. *Cord. Hist.* 170. 2. *f.*

On shady mountainous declivities.

Near Tintern abbey, Monmouthshire. *Ray.* In the north of Yorkshire, about North Bierley, and other places. *Dr. Richardson.* Received from the same county by *Mr. T. F. Forster.* Sent from thence by *Mr. W. Brunton*; and from Staffordshire, by the *Rev. Thomas Gisborne.* In the Highlands, as well as Lowlands, of Scotland.

Perennial. *July.*

Root not unlike the last, slender, undulated, widely creeping, but blacker. *Fronde* about a foot high, bright green, smooth, delicate and flaccid. *Stalk* slender, brittle, two or three times as tall as the leafy part, pale, very smooth, except a few scales at the bottom. Outline of the *frond*, when laid out flat, nearly pentagonal. *Branches* three, the upper one largest; all loosely spreading, or drooping, so as to be convex above; each pinnate, with pinnate, or pinnatifid, sessile, crowded, oblong, obtuse leaflets, or segments, wavy or serrated, especially about their extremities, all finely veined, often rather revolute, smooth, except some minute downiness on the midrib. *Capsules* numerous, pale, about twenty in each of the masses, which are convex, ranged near the margin of each leaflet or segment, remaining perfectly distinct, and finally turning brownish, destitute of any hairs, scales, or other covering.

4. *P. calcareum.* Rigid Three-branched Polypody.

Fronde three-branched; branches doubly pinnate, erect, rather rigid; segments obtuse, somewhat crenate. Masses of capsules crowded, finally confluent.

P. calcareum. *Fl. Br.* 1117. *Engl. Bot. v. 22. t. 1525.* *Purt. v. 2.* 506. *Sw. Syn. Fil.* 42. *Willd. Sp. Pl. v. 5.* 210.

P. Dryopteris *Dicks. Dr. Pl.* 16. *Bolt. Fil.* 53. *t. 1.*

Dryopteris Tragi. *Ger. Em.* 1135. *f.*

Filix pumila saxatilis prima. *Clus. Hist. v. 2. 212. f. Pann. 704. f.*

On mountainous heaths, or in woods, on a limestone soil.

About Matlock bath, Derbyshire, in broken rocky ground.

Perennial. *July.*

Root creeping, but stouter and less extended than in the preceding species. *Frond* more firm and rigid; its *stalk* more scaly about the lower part. All the three *branches* upright, smaller than the last, rigid, and not loosely spreading. *Masses* of *capsules* more crowded, finally in some degree confluent, and of a browner hue.

464. ASPIDIUM. Shield-fern.

Swartz, in Schrad. Journ. for 1800. v. 2. 29. Syn. Fil. 42. Willd.

Sp. Pl. v. 5. 211. Fl. Br. 1118. Spreng. Crypt. f. 22.

Filix. Tourn. t. 311, 312.

Lonchitis. Tourn. t. 314.

Nat. Ord. see n. 463.

Masses of *capsules* orbicular, convex, scattered over the back of the *frond*, in rows, between the midrib of each lobe and the margin. *Capsules* very numerous, globose, on capillary stalks; each of 1 cell and 2 equal, hemispherical valves, bound together by a transverse jointed ring, which finally separates them by its elasticity when dry. *Seeds* numerous, roundish, very minute. *Cover* membranous, orbicular, or kidney-shaped, with a lateral cleft, simple, fixed in the centre of each *mass*, often peltate, and separating all round, permanent.

Habit like the last genus. Species much more numerous.

Fronde in some evergreen; in most deciduous.

* *Frond* simply pinnate.

1. A. *Lonchitis*. Rough Alpine Shield-fern.

Frond linear-lanceolate, simply pinnate; leaflets crescent-shaped, declining, bristly-serrated. *Stalks* scaly.

A. *Lonchitis.* *Sw. Syn. Fil. 43. Willd. Sp. Pl. v. 5. 224. Fl. Br. 1118. Hook. Scot. p. 2. 153.*

Polypodium Lonchitis. *Linn. Sp. Pl. 1548. Engl. Bot. v. 12. t. 797. Bolt. Fil. 34. t. 19. Fl. Dan. t. 497.*

P. n. 1711. *Hall. Hist. v. 3. 16.*

Polystichum Lonchitis. *Roth Germ. v. 3. 71.*

Lonchitis aspera major. *Raii Syn. 118. Ger. Em. 1140. f. Matth. Valgr. v. 2. 273. f. Camer. Epit. 664. f. Moris. v. 3. 566. sect. 14. t. 2. f. 1.*

L. mas, seu latifolia, aspera minor. *Barrel. Ic. t. 1121.*

In the fissures of alpine rocks.

On the highest rocks of Carnarvonshire. *Mr. Lhwyd*. About the church of Llanberris. *Dr. Richardson*. In Breadalbane. *Rev. Dr. Stuart*. Near Stirling. *Dr. Buchanan Hamilton*. Not uncommon among the Highland mountains. *Hooker*.

Perennial. *May, June*.

Fronde about a span high, tufted, linear-lanceolate, firm, rigid and harsh, deep green, whether evergreen, that is biennial, or annual, I know not. *Stalk* short, clothed below the leafy part with large, broad, taper-pointed scales; with smaller ones above. *Leaflets* numerous, short, crowded, stalked, alternate, about three-quarters of an inch long, acute, simple; smooth above; rather scaly at the back, broad at the base, with a lobe at the upper edge, while the corresponding part of the lower is sloped or cut away, the whole *leaflet* assuming a crescent shape; the margin beset with unequal bristly serratures. *Masses* of *capsules* in simple rows, between the midrib and margin of each leaf of the upper half of the frond, crowded, light brown. *Cover* orbicular, with a notch at one side, strongly fixed in the centre, separating all round, and finally almost obliterated by the elevation of the abundant *capsules*.

Some small mountain varieties of *A. aculeatum* are often mistaken for this, and hence it has been supposed a dwarf state of that common species. The true *Lonchitis*, however, is very distinct in appearance and characters, much less inclined to be lobed, and never separately auricled: its *masses* are thrice the size of the *aculeatum*. It is not easy of culture, and rather dwindles away, instead of growing more luxuriant, in a garden.

** *Frond more or less doubly pinnate*.

2. *A. Thelypteris*. Marsh Shield-fern.

Frond pinnate; leaflets linear-lanceolate, deeply pinnatifid, smooth, somewhat crenate; their lowermost segments elongated. Masses globular; at length confluent. Cover central, lax. Root trailing.

A. Thelypteris. *Sw. Syn. Fil.* 50. *Willd. Sp. Pl.* v. 5. 249. *Fl. Br.* 1119. *Hook. Scot.* p. 2. 154.

Polypodium Thelypteris. *Linn. Mant.* 505. *Syst. Veg.* ed. 14. 937. *Engl. Bot.* v. 15. t. 1018. *Fl. Dan.* t. 760. *Dicks. H. Sicc. fasc.* 6. 15. *Ehrh. Crypt.* 32.

P. n. 1697. *Hall. Hist.* v. 3. 12.

Polystichum Thelypteris. *Roth Germ.* v. 3. 77.

Acrostichum Thelypteris. *Linn. Sp. Pl.* 1528. *Bolt. Fil.* 78. t. 43, 44.

Thelypteris palustris non ramosa. *Rupp. Jen.* 322. *Schmid. Ic.* 45. t. 11.

Filix minor palustris repens. *Raii Syn.* 122.

F. tenuissimè et profundè denticulata Montbelgardica. *Bauh. Hist. v. 3. p. 2. 731. f.*

F. non ramosa minor sylvatica repens. *Moris. v. 3. 580. sect. 14. t. 4. f. 17.*

Dryopteris. *Lob. Ic. 815. f. Ger. Em. 1135. f.*

In boggy meadows and marshes, especially on a gravelly soil.

On St. Faith's Newton bogs near Norwich. *Mr. Pitchford.* At Lound, near Yarmouth. *Mr. D. Turner.* In Terrington Car, Yorkshire. *Mr. R. Teesdale.* Bedfordshire. *Abbot.* Cambridge-shire. *Relhan.* Abundant in Scotland. *Dickson, Hooker.* At Wroxham, Norfolk.

Perennial. *July.*

Root creeping extensively, by means of long, slender, blackish, thread-shaped, smooth or downy runners. *Fronds* rather scattered, quite erect, deep green, delicate and smooth, rarely a little hairy, as in *Engl. Bot.*, each about fifteen or eighteen inches high; their *stalks* slender, naked, or only slightly scaly. *Leaflets* elongated horizontally, taper-pointed, very deeply pinnatifid; their segments when barren obtuse, and obscurely crenate; when fertile narrower, more acute, and revolute; the lower part usually longest. *Midrib* sometimes densely hairy. *Cap-sules* minute, in small round *masses*, each at first covered by a thin, white, laeolated *cover*, fixed by the centre, but soon elevated and obliterated, the *masses* running together into simple, sometimes aggregate, lines, and nearly covering the lobes, so that Linnæus was induced, by some such advanced specimens, to refer this Fern to his genus *Acrostichum*, into which indeed he originally admitted several discordant plants.

3. *A. Oreopteris.* Heath Shield-fern.

Fronn pinnate; leaflets deeply pinnatifid, entire, besprinkled underneath with resinous globules. Masses nearly marginal, at length confluent. Root tufted.

A. Oreopteris. *Sw. Syn. Fil. 50. Willd. Sp. Pl. v. 5. 247. Fl. Br. 1120. Hook. Scot. p. 2. 154.*

Polypodium Oreopteris. *Ehrh. Crypt. 22. Dicks. Tr. of Linn. Soc. v. 1. 181. H. Sicc. fasc. 1. 18. With. 775. Hull 238. Sibth. 270. Teesdale Tr. of Linn. Soc. v. 2. 113. Engl. Bot. v. 15. t. 1019. Fl. Dan. t. 1121. Hoffm. Germ. v. 2. 5.*

P. Thelypteris. *Huds. 457. Bolt. Fil. 40. t. 22. f. 1, 2. Hedw. Theor. 44. t. 6.*

P. fragrans. *Huds. 457 ? as suggested by Mr. Teesdale.*

P. limbospermum. *Bellardi Act. Taurin. v. 5. 253; from the author, Allion. Auctuar. 47.*

P. pterioides. *Villars Dauph. v. 3. 841; from the author.*

P. montanum. *Vogler Diss.—Willd. Berol. 291.*

Polystichum montanum. *Roth Germ. v. 3. 74.*

Filix non ramosa, nostras pinnulis brevibus, acutioribus, integris, nonnihil falcatis, punctis ferrugineis ad oras pulverulentibus. *Pluk. Amalth. 91.*

F. maris vulgaris varietas. *Doody in Raii Syn. ed. 2. 341. ed. 3. 122.*

β . *F. pumila saxatilis altera* Clusii. *Raii Syn. 122.*

On mountainous heaths, and in dry woods.

Most plentiful in Scotland. *Dickson*. In the north of England. *Withering*. Near Southampton. *Mr. Lambert*. Gathered on Ben Lomond, in 1782, and long afterwards at Hafod, Cardigan-shire.

β . Plentiful in stony mountainous parts of Derbyshire, Yorkshire, and Westmoreland. *Ray*. On the Welsh mountains about Llanberys. *Richardson*.

Perennial. *July*.

This species, which has formerly been confounded with the preceding as well as with the following, agrees with the latter in size and general aspect, being usually thrice as large as *A. Thelypteris*; though the variety β is scarcely equal to the ordinary height of even that plant. The root is not creeping, but tufted, large and scaly, formed of many strong, stout, entangled fibres. Fronds several, ranged in a circle, erect, lanceolate, leafy nearly to the bottom, their stalks being very short and scaly; the leafy part mostly naked and smooth, channelled along the upper side. Leaflets in general opposite, sessile, but not crossing each other at the bottom, numerous, pointed, deeply and numerously pinnatifid, smooth except the midrib, which is for the most part finely downy, not scaly, as seems to be expressed in *Engl. Botany*; the segments flat, obtuse, entire, very rarely crenate at the extremity; the under side besprinkled with shining, yellowish, resinous globules, exhaling, more or less constantly, a fragrant scent, whence perhaps Mr. Hudson might take this fern for *Polypodium fragrans* of Linnæus. These globules are represented in Hedwig's figure, quoted above, as if they were the seeds. The real masses of capsules are disposed in a simple row, near the margin of each lobe, whence some have taken the plant for *Polypodium marginale* of Linnæus, which is a very distinct North American species. When ripe these masses become nearly confluent, forming brown, marginal, beaded lines. The cover of each mass is small and thin, fixed by the centre, jagged, and soon obliterated.

I have seen no original specimen of Ray's plant, my β ; but the small ones, gathered on Ben Lomond in 1782, and then taken for *Thelypteris*, their resinous globules being noticed as something peculiar, may very probably be this variety, though it by no means answers to the *Filix pumila saxatilis altera* of Clusius, which has a creeping root, and long naked stalks.

4. *A. Filix mas*. Male Shield-fern.

Frond doubly pinnate; leaflets obtuse, serrated, partly confluent. Stalk scaly. Masses near the midrib. Cover orbicular.

A. Filix mas. *Sw. Syn. Fil.* 55. *Willd. Sp. Pl.* v. 5. 250. *Fl. Br.* 1121. *Engl. Bot.* v. 21. t. 1458. *Hook. Scot. p.* 2. 154. *Lond.* t. 40.

A. cristatum. *Engl. Bot.* v. 28. t. 1949.

Polypodium Filix mas. *Linn. Sp. Pl.* 1551. *Huds.* 458. *Bolt. Fil.* 44. t. 24. *Woodv.* t. 49. *Gunn. Norveg.* v. 1. 4. t. 1. f. 4. *Bull. Fr.* t. 183. *Dicks. H. Sicc. fasc.* 3. 19. *Ehrh. Crypt.* 141.

P. n. 1701. *Hall. Hist.* v. 3. 13; *excl. Vaillant's syn.*

Polystichum Filix mas. *Roth Germ.* v. 3. 82.

Filix mas vulgaris. *Raii Syn.* 120. *Ger. Em.* 1128. f. *Lob. Ic.* 812. f. *Fuchs. Hist.* 595. f; not good. *Ic.* 341. f. *Matth. Valgr.* v. 2. 626. f. not good. *Camer. Epit.* 991. f. better. *Dalech. Hist.* 1222. f.

F. non ramosa dentata. *Bauh. Pin.* 358. *Moris.* v. 3. 578. *sect.* 14. t. 3. f. 6.

F. vulgaris. *Trag. Hist.* 546. f.

In woods, dry ditches, and on shady banks, common.

Perennial. *June, July.*

Root tufted, large, scaly. *Fronds* several, three feet high, erect, not so regularly disposed in a circle as the foregoing, but of the same lanceolate shape, and leafy nearly to the bottom; their *stalks* and *midribs* scaly, or chaffy, throughout. *Leaves* alternate, taper-pointed, pinnate. *Leaflets* numerous, crowded, sessile, for the most part distinct, occasionally somewhat combined at the base, but far less so than the figures of the earlier writers represent them. Dr. Hooker's and Bulliard's plates are the most correct in this particular. Each *leaflet* is oblong, obtuse, crenate throughout, the lateral notches broadest and most shallow, the terminal ones more crowded and acute, without any terminal bristles; both sides are smooth, destitute of glandular globules, but there is a depression on the upper one, over the insertion of each mass of *capsules*. These *masses* are circular, tawny, ranged in simple, close, short rows, near the partial midrib, and scarcely occupying more than the lower half of each leaflet. *Cover* circular, durable, crenate, tumid, with a cleft terminating in the central depression. *Capsules* numerous, of a shining brown, prominent all round a little beyond the cover.

The *root* is a famous Swiss remedy for intestinal worms, chiefly the Tape-worm, which in that country is a different species from our's; see Sir Anthony Carlisle's paper on these animals, in *Tr. of Linn. Soc.* v. 2. 247. The peculiar nauseous

flavour of this root was detected by a good botanist, who had taken it in Switzerland, in a quack medicine recommended for worms in England, the cunning dealer in which would be glad to bring it into general use as a purge. But there are many drugs more safe, and better known in their operation.

This species was certainly never mistaken for *A. cristatum* by the writer of *Engl. Bot.* p. 1949; but Mr. Sowerby was deceived by a wrong specimen, sent him from the Isle of Wight, which he supposed, of course, to be correct, and from which he drew the figure. The blunder was set right in v. 30. p. 2125 of the same work.

5. *A. cristatum*. Crested Shield-fern.

Fronde linear-oblong, almost doubly pinnate; leaflets decurrent, ovate, obtuse, crenate or pinnatifid, with little sharp terminal teeth. Stalk scaly at the base. Masses equidistant from the midrib and margin. Cover orbicular.

A. cristatum. *Sw. Syn. Fil.* 52. *Willd. Sp. Pl.* v. 5. 252. *Comp. ed.* 4. 173. *Engl. Bot.* v. 30. t. 2125. *Hook. Scot.* p. 2. 154. *Lond.* t. 113, excellent.

Polypodium cristatum. *Linn. Sp. Pl.* 1551. *Afzel. in Stockh. Trans.* for 1787. 256. t. 9.

P. n. 848. *Linn. Fl. Suec. ed.* 1. 308; omitting the synonyms.

P. Callipteris. *Ehrh. Beitr.* v. 3. 77. *Crypt.* 53. *Hoffm. Germ.* v. 2. 6.

Polystichum cristatum. *Roth Germ.* "v. 3. 84."

On boggy heaths among coarse grass and other plants. *Hooker*.

Sent from the Lows on Holt heath, Norfolk, in 1805, by the *Rev. R. B. Francis*. On bogs, amongst Alder bushes, at Westleton, Suffolk. *Mr. Davy*.

Perennial. *August*.

Root tufted. *Fronde* several, quite erect, readily distinguished from the last, as Dr. Hooker observes, by their pale yellowish green hue. But the present species is well characterized by several other indisputable marks. Each *frond*, at most two feet high, is in its outline remarkably linear, not lanceolate; nor is it leafy throughout, but the *stalk*, beset towards the bottom with large, rounded, brown, membranous scales, is destitute of *leaves*, or *wings*, for about one-third of its height from the root. *Leaves* tapering upwards from a broad base, quite smooth, truly pinnate, though their broad, ovate, blunt *leaflets* are decurrent, and therefore somewhat confluent; their margins are sharply toothed, most copiously about the extremity, and the teeth end in very short bristles. *Masses* large, in simple rows, at an equal distance between the midrib of each leaflet and its margin. *Cover* tumid, white when fresh, permanent, soon becoming or-

bicular, being fixed by one spot only. *Capsules* blackish, but they become tawny, as well as the *cover*, after a while.

6. *A. aculeatum*. Common Prickly Shield-fern.

FronD doubly pinnate; leaflets ovate, pointed, stalked, somewhat crescent-shaped, fringed with prickly serratures. Midribs all scaly or shaggy. Cover orbicular, flat.

A. aculeatum. *Sw. Syn. Fil.* 53. *Willd. Sp. Pl.* v. 5. 258. *Fl. Br.* 1122. *Engl. Bot. v.* 22. t. 1562. *Hook. Scot. p.* 2. 154.

Polypodium aculeatum. *Linn. Sp. Pl.* 1552. *Huds.* 459. *Lightf.* 675. *Bolt. Fil.* 48. t. 26. *Mill. Illustr. t.* 101. *Ehrh. Phytoph.* 78.

P. n. 1712, α . *Hall. Hist.* v. 3. 16.

Polystichum aculeatum. *Roth Germ. v.* 3. 79.

Filix mas non ramosa, pinnulis latis auriculatis spinosis. *Raii Syn.* 121. *Goodyer in Ger. Em.* 1130. *Moris. v.* 3. 580. *sect.* 14. t. 3. f. 15. *Pluk. Almag.* 152. *Phyt. t.* 179. f. 6; a young specimen.

β . *F. Lonchitidi affinis*. *Raii Syn. ed.* 2. 48. *ed.* 3. 121.

F. aculeata Lonchitidis æmula nostras. *Pluk. Almag.* 151. t. 180. f. 3.

In woods and about shady banks, especially such as are moist and stony.

β . On the Welsh mountains. *Mr. Lhwyd*. In dry woods near Rippon, Yorkshire. *Mr. W. Brunton*.

Perennial. *July*.

Root tufted, large. *FronDs* numerous, spreading in a circle, each rather smaller than those of *A. Filix mas*, of a dark blueish green, paler beneath, lanceolate, tapering to a point, firm and somewhat rigid, elegantly, regularly, and closely twice pinnate, with a considerable very scaly *stalk*; the *midrib*, and partial *ribs* also, being clothed with narrower scales, sometimes occurring still narrower, like hairs, on the backs of the leaflets. *Leaves* alternate, close together, linear-lanceolate, taper-pointed. *Leaflets* numerous, alternate, distinctly though rather shortly stalked, ovate inclining to lunate, with an oblique, acute, tapering point; the serratures few and unequal, likewise taper-pointed, the lowermost of which, at the upper edge, forms more or less of a lobe, especially in the lowest leaflet, which is rather bigger than the rest. *Masses* smaller, and more remote, than in the two last. *Cover* orbicular, without a notch, flat, with a central protuberance when young.

β , sometimes mistaken for *A. Lonchitis*, *n.* 1, is a starved variety, owing to a dry and barren soil. *Plukenet's t.* 179. f. 6, represents merely a young specimen. The β of *Fl. Brit.* I have now separated, as unquestionably distinct;—see the following.

7. *A. angulare*. Angular-leaved Shield-fern.

Frond doubly pinnate; leaflets ovate, bluntish, stalked, fringed with bristly serratures, each leaflet with a lateral lobe at the base; the lowermost elongated, partly pinnatifid. Stalk scaly. Ribs all shaggy. Cover orbicular, umbilicated.

A. angulare. Willd. *Sp. Pl.* v. 5. 257; by the description.

A. aculeatum β . *Fl. Br.* 1122.

Polypodium n. 1712 γ . *Hall. Hist.* v. 3. 16.

Filix mas aculeata nostras, alis expansis, muscosâ lanugine aspersa. *Pluk. Almag.* 151. *Phyt. t.* 180. *f.* 1.

In woods and shady places.

In various parts of England. *Mr. R. Teesdale*. In *Mr. Rose's* herbarium. Found likewise by *Mr. E. Forster*.

Perennial. *July*.

Softer and more delicate in texture, as well as more shaggy, than the last. The *leaflets* are smaller, more numerous, blunter, and rounded at the extremity, though tipped with a soft bristly point, and each of them, even to the smallest, has a broad conspicuous lobe, at the base of the upper margin; the lowest of all, at the upper edge of each main leaf, is half as long again as its next neighbour, more strongly serrated, and in its lower part generally *pinnatifid*. All the lobes and serratures end in soft bristly points. *Stalk*, and principal *rib*, densely covered with scales, which are narrower in proportion as they are higher up, those on the partial ribs, or on the leaflets occasionally, being almost capillary. *Masses* numerous and crowded. *Cover* orbicular, for the most part entire, with a central depression. The outline of the whole *frond* is rather broader than *A. aculeatum*, and the more copious, distinct, rounded, auricled *leaflets* give the whole a rich and elegant aspect.

Having seen no specimen of Willdenow's plant, nor any figure being quoted by him, I cannot be certain that we mean the same thing. His description however is excellent, and without exception.

8. *A. lobatum*. Close-leaved Prickly Shield-fern.

Frond doubly pinnate; leaflets elliptical, pointed, decurrent, slightly crescent-shaped, somewhat serrated; the foremost of the lowest pair very large. Stalk and midrib scaly. Cover orbicular, umbilicated.

A. lobatum. *Sw. Syn. Fil.* 53. *Willd. Sp. Pl.* v. 5. 260. *Fl. Br.* 1123. *Engl. Bot.* v. 22. t. 1563. *Forst. Tonbr.* 118.

Polypodium lobatum. *Huds.* 459.

Filix aculeata major, pinnis auriculatis crebrioribus, foliis integris angustioribus. *Ray Syn.* 121.

On shady hedge banks.

Frequent about Black Notley, Essex. *Ray*. In other parts of that county. *Mr. E. Forster*. Near Tonbridge, and between Groombridge and Withyham, Sussex. *Mr. T. F. Forster*. At Edgefield, near Holt, Norfolk. *Rev. R. B. Francis*. At the Hermitage, near Edinburgh.

Perennial. *July*.

This is most akin to *A. aculeatum*, n. 6, but *Ray*, in his excellent *Synopsis*, has well marked their differences. The *fronds* of the present species, though nearly as long as in that, are narrower, the *leaves*, or *pinnæ*, being shorter, and they are shorter still than in *A. angulare*. They are also more crowded, especially at the base, where the foremost *leaflet* of each lowermost pair lies close to the *main rib*, and is so much larger than any of the other leaflets, as to leave no vacancy along the middle part of the frond, sometimes overlaying the rib itself. The *leaflets* in general are rather larger than in either of the foregoing, more pointed, and of a firmer texture, as well as of a lighter or paler green, more polished, and less hairy, the *main rib* only being scaly, the *partial* ones but slightly so towards the base. The decurrent character of the *leaflets* was first pointed out to me by *Mr. D. Turner*.

Plukenet's synonym, erroneously quoted in the *Fl. Brit.*, properly belongs to the small variety of *A. aculeatum*, where it is already indicated.

9. *A. spinulosum*. Prickly-toothed Shield-fern.

Frond somewhat triangular, smooth, doubly pinnate; leaflets decurrent, on a winged stalk, elliptical, deeply serrated, with prickly teeth, and a zigzag midrib. Stalk elongated; scaly at the base. Cover orbicular, with a lateral notch.

A. spinulosum. *Willd. Sp. Pl.* v. 5. 262. *Fl. Br.* 1124. *Engl. Bot.* v. 21. t. 1460. *Forst. Tonbr.* 119.

Polypodium spinulosum. *Fl. Dan.* t. 707. *Retz. Prodr.* 250. *With.* 778.

P. n. 841. *Muller Fridrichsdal.* 193. t. 2. f. 2.

Filix pumila saxatilis altera. *Pluk. Almag.* 151. *Phyt.* t. 179. f. 5.

In marshy places, not common.

In bogs upon Birmingham heath, and in Devonshire. *Withering*.

In a cavern on spike island near Cove, below Cork. *Mr. J. T.*

Mackay. In the north of Ireland. *Dr. Scott*. A single specimen, prorably gathered in Norfolk, is in *Mr. Rose's* herbarium.

Perennial. *June, July*.

Root somewhat creeping. *Fronds* of a delicate light green, about a foot high, smooth in every part, except the base of the common stalk; their outline triangular, or deltoid, the lowermost of their *leaves*, or primary divisions, being longest. *Stalk* about one-third of the whole frond in length, pale, slender, smooth and naked, except a few scales towards the bottom. *Leaves* not quite opposite; *leaflets* more generally so, gradually a little larger downward, but all tolerably equal and uniform, elliptical, bluntish, running down at the base into the narrow wings of their common stalk; the middle rib of each zigzag, or serpentine; the margin beset with broad, deep, incurved serratures, each tipped with a bristly point. *Masses* rather small and distant, in simple rows, or somewhat scattered, often towards the margin, or the notches, of the leaflets. *Cover* thin, orbicular when perfect, with a lateral fissure, but finally pushed aside by the swelling *capsules*.

Dr. Swartz seems to confound this with the next, but they are perfectly and essentially distinct. Dr. Withering was the first systematic British botanist who determined the present species. Plukenet's figure is excellent, but the *Filix pumila saxatilis altera* of Clusius, which Haller could not ascertain, and for which Parkinson mistook our fern, is evidently different. Morison's *sect. 14. t. 3. f. 11*, quoted by Willdenow, no less unquestionably belongs to something else, being perhaps the true *A. cristatum*, *n. 5*, which Bobart's herbarium at Oxford may possibly determine. The plant of Goodyer in *Ger. Em.* 1129, to which Morison refers, appears to be our *A. dilatatum*.

10. *A. dilatatum*. Broad Sharp-toothed Shield-fern.

Frond doubly pinnate; leaflets deeply pinnatifid; lobes deeply serrated, with prickly teeth. Common stalk scaly. Cover kidney-shaped, tumid; finally orbicular, with a lateral notch.

A. dilatatum. Willd. *Sp. Pl.* v. 5. 263. *Fl. Br.* 1125. *Engl. Bot.* v. 21. t. 1461. *Forst. Tonbr.* 119. *Hook. Scot.* p. 2. 154; *excl. A. spinulosum*.

A. spinulosum. Sw. *Syn. Fil.* 54?

Polypodium dilatatum. Hoffm. *Germ.* v. 2. 7.

P. aristatum. Villars *Dauph.* v. 3. 844. *Bellardi in Act. Taurin.* v. 5. 255.

P. cristatum. Huds. 457. *With.* 778. *Bolt. Fil.* 42. t. 23. *Schreb. Lips.* 71. *Ehrh. Crypt.* 81.

P. n. 1705. *Hall. Hist.* v. 3. 14.

P. n. 845. *Muller Fridrichsdal.* 193. t. 2. f. 4.

Polystichum multiflorum. Roth *Germ.* v. 3. 87.

Filix mas ramosa, *pinnulis dentatis*. *Ger. Em.* 1129; *no f.* *Raii Syn.* 124. *Pluk. Almag.* 155. *Phyt. t.* 181. f. 2.

F. ramosa dentata, ramulis et pinnulis longiùs ab invicem distantibus. *Mapp. Alsat.* 106. *f.* 8.

F. tenuissimè secta ex monte Ballon. *Bauh. Hist.* v.3. p. 2. 731. *f.*

In shady watery sandy places, or moist rocky woods.

Perennial. *July, August.*

Root tuberous, scarcely creeping. *Fronds* various in size, generally about two feet high, erect, broad and spreading, bright green, delicately and very copiously subdivided, being almost triply pinnate, so deeply are all the *leaflets* pinnatifid, with oblong, obtuse, parallel, deeply serrated segments, their serratures sharp, each tipped with a small bristly point. The main *stalk* is slender, moderately scaly all the way up, but most so in its leafless part; the partial ribs are also scaly, or roughish. All the subdivisions are partly opposite, partly alternate, the ultimate ones slightly decurrent, their midribs straight, some of them only a little zigzag. The secondary divisions, or *leaves*, of the lower principal ones are much larger and longer than their opposite neighbours. *Masses* very numerous, because the *frond* is large and so much subdivided, but they are less crowded than in many ferns, though more so than in the last, they are first tumid and kidney-shaped, the lobes directed towards the base of each leaflet, or segment, but the *cover* when burst becomes orbicular, with a deep fissure at the lower side. The *fructification* is situated nearer the midrib than the margin of each *leaflet* in the present species; in the following the reverse is observable.

My learned friend Dr. F. Hamilton, late Buchanan, has sent from Leney, near Stirling, along with my *A. dilatatum*, a specimen more precisely answering to Plukenet's *t.* 181. *f.* 2, which he suspects may be different. This latter is rather more pale and delicate, but I cannot discern any specific distinction.

11. *A. dumetorum*. Thicket Shield-fern.

Frond doubly pinnate; leaflets pinnatifid; lobes with terminal, sharp, prickly teeth. Common stalk scaly. Cover orbicular, flat, with a deep notch.

Polypodium rhæticum. *Huds.* 458; according to the *Banksian herbarium*.

P. cristatum β . *Huds. ed.* 1. 390.

Filix montana ramosa minor, argutè denticulata. *Raii Syn.* 124.

F. alpina, myrrhidis facie, Cambrobritannica. *Fluk. Almag.* 155. *Phyt. t.* 89. *f.* 4; good.

In bushy stony places, under shady rocks, or on mountains.

On the summit of mount Glyder, overhanging the lake of Llyn Ogwan, North Wales. *Mr. Lhwyd.* Near Phainon Vellon. *Dr.*

Richardson. In Westmoreland. *Hudson*. Under rocks in the north-east corner of Rivelston wood, near Edinburgh; also among bushes under the high rocks at the top of Cromford moor, near Matlock bath, Derbyshire.

Perennial. *July*.

About one-third the size of the last, with which it agrees in general habit and structure, but the *leaflets* are rather more ovate, and their segments more closely crowded together, less serrated at the sides, but their bristly teeth more numerous at the extremity of each segment. *Masses* few, small and rather scattered. *Cover* thin, pale, flat, not tumid nor kidney-shaped, but more orbicular, with a deep notch at the lower part, and finally turned loosely aside, by the few, rather large, shining, brown *capsules*, whose rings are very apparent. Sometimes the *masses* are placed at the very edges or points of the segments, and the *covers* are often torn; but they are never tumid, like a kidney, nor fixed closely by their outer margin, as those of *A. dilatatum* are. I think these two species may always be distinguished by the situation of their fructification, and the nature of their *covers*.

Mr. Henry Shepherd, of the Botanic Garden, Liverpool, raised the *A. dumetorum* in plenty, from seed brushed from a Derbyshire specimen. The individuals, whether cultivated in pots or on rock-work, retain their original habit and characters, the largest not exceeding a foot in height. Others, from Scotland, have rather more distant *leaflets*, with more spreading segments, but their *fructifications* agree, both differing alike from *A. dilatatum*. The midribs of their *leaflets* accord with this last, and not at all with *A. spinulosum*.

12. *A. Filix fœmina*. Female Shield-fern.

Fronde doubly pinnate; leaflets linear-oblong, pinnatifid, serrated, pointless. Stalk smooth. Cover oblong, finally somewhat kidney-shaped, jagged.

A. Filix fœmina. *Sw. Syn. Fil.* 59. *Willd. Sp. Pl.* v. 5. 276. *Fl. Br.* 1124. *Engl. Bot.* v. 21. t. 1459; not good. *Hook. Scot.* p. 2. 155.

A. Filix mas. *Fl. Dan.* t. 1346!

Polypodium Filix fœmina. *Linn. Sp. Pl.* 1551. *Huds.* 458. *Bolt. Fil.* 46. t. 25. *Dicks. H. Sicc. fasc.* 5. 18.

P. rhæticum. *Linn. Sp. Pl. ed.* 1. 1091. *ed.* 2. 1552. *Herb. Linn.*

P. molle. *Schreb. Lips.* 70. *Ehrh. Crypt.* 91.

P. n. 1704. *Hall. Hist.* v. 3. 14.

Asplenium Filix fœmina. *Bernhardi in Schrad. New Journ.* v. 1. p. 2. 27. t. 2. f. 7.

Filix mas non ramosa, pinnulis angustis raris profundè dentatis.

Ger. Em. 1130, no f. *Raii Syn.* 121. *Pluk. Almag.* 151. *Phyt. t.* 180. f. 4. *Moris. v.* 3. 579. sect. 14. t. 3. f. 8.

F. mollis, sive *glabra*, *vulgari mari non ramosæ accedens*. *Bauh. Hist. v.* 3. p. 2. 730. f.

In wet shady situations, common.

Perennial. *June, July*.

An elegant *fern* about as tall as *A. dilatatum*, but narrower, and more lanceolate, in its general outline, being broadest towards the middle, quite smooth in every part, of a rich, rather deep, green. The *root* is large and tufted. Naked part of the *stalk* very short; the whole destitute of scales. Primary divisions, or *leaves*, about forty, alternate, taper-pointed. *Leaflets* in each about as many, linear-oblong, bluntish, elegantly and finely pinnatifid, sharply notched, without bristly points; the uppermost somewhat decurrent. *Masses* solitary towards the base of each lobe, oblong, but finally becoming nearly round. *Cover* lateral, at first oblong, with a broad base; subsequently kidney-shaped, but not tumid; and finally, as the ends converge, orbicular, with a broad notch at the base, assuming the precise character of *Aspidium*; the outer edge rough or jagged. *Capsules* rather numerous, brown.

Other figures, besides those above indicated, are referred by various authors to this species, but they are either doubtful or inaccurate.

Polypodium rhæticum of Linnæus, preserved in the Linnæan herbarium, is merely a badly-dried specimen of the *Filix fœmina*. It was sent by Sauvages from Montpellier, with the synonym of John Bauhin, *Filix rhætica tenuissimè denticulata*, and a reference to the tenth *Polypodium* of Haller's *Enumeratio* 140, an obscure plant, whose description does not answer to this fern. On the specimen of Sauvages however, and on nothing else, Linnæus founded his *P. rhæticum*, in both editions of *Sp. Pl.*, and to this his specific character, and all he has said of the plant, every where refers. His *P. rhæticum* therefore is a nonentity, though that name may remain with John Bauhin's plant, which seems to be different. *P. rhæticum* of other authors, having nothing to do with either, cannot retain the name. Its history will be found under the third species of the following genus.

13. *A. irriguum*. Brook Shield-fern.

Frond lanceolate, doubly pinnate; leaflets oblong, deeply serrated, pointless. Stalk quadrangular. Cover roundish-oblong, finally kidney-shaped, jagged.

A. irriguum. *Engl. Bot. v.* 31. t. 2199. *Comp. ed.* 4. 172. *Forst. Tonbr.* 119.

About the margins of clear springs, in the south of England. In several places near Tonbridge. *Mr. T. F. Forster.*

Perennial. *June, July.*

Scarcely one-fourth so large as the preceding, of which nevertheless some good botanists have thought it a variety; and indeed after long cultivation, though raised originally from seed, it considerably approaches that species. In a wild state the *fronds* are of a more narrow lanceolate figure, and of a paler pellucid green; the main *stalk* occasionally scaly, but in general quite smooth, and exactly quadrangular, though the latter circumstance varies. *Leaflets* shorter, and somewhat less linear, than in *Filix femina*, deeply serrated, or partly pinnatifid, their segments sharply cut, without bristly points. *Masses* by the side of the midrib of a few of the lowermost lobes of each leaflet, solitary, oblong, though short, and ultimately roundish, or oval. *Cover* at first oblong, soon becoming kidney-shaped, or almost orbicular, with a lateral notch, flat, thin, membranous and jagged. *Capsules* dark brown.

465. CYSTEA. Bladder-fern.

Cystopteris. *Bernhardi* in *Schrad. New Journ.* v. 1. p. 2. 26. t. 1. f. 9.

Cyathea. *Fl. Br.* 1138; but not *Act. Taurin.* v. 5. 416. n. 1 4, nor *Tracts* 251. n. 1—4. See *Plum. Fil.* t. 2.

Athyrium. *Spreng. Crypt. f.* 30.

Nat. Ord. see n. 463.

Masses of capsules orbicular, convex, scattered variously over the back of the *frond*, between the midrib of each leaflet, or lobe, and the margin. *Capsules* several, globose, on short stalks; each of 1 cell, and 2 equal, hemispherical valves, bound together by a transverse jointed ring, which finally separates them, when dry, by its elasticity. *Seeds* numerous, roundish, very minute. *Cover* membranous, white, orbicular, concave, fixed by a narrow point of attachment at the side of each *mass* underneath; at first enfolding the whole; but subsequently separating, turned to one side, unequally jagged, flaccid and irregular, sometimes pointed; finally obliterated, or concealed by the swelling capsules.

Fronds oblong, of humble growth, erect, very delicate in habit, compound, finely cut. *Stalk* about half the length of the leafy portion, smooth. *Leaflets* ovate or oblong, serrated, toothed, or wavy. *Masses* small, with a delicate, white, globular *cover* while young, which renders them very conspicuous in an early state, but afterwards

leaves them naked, more prominent, sometimes crowded or confluent. *Capsules* brown or black.

In reviewing the whole order of Ferns, for the purpose of establishing their generic distinctions on better principles than had heretofore been suggested, I found the curious little family, which I am now about to describe, so distinct in habit and characters from *Polypodium*, to which it had been referred, as well as from what is now termed *Aspidium*, that I could not associate it with either. The globular shape of its *involucrum*, or *cover*, added to the insertion of that part underneath the *capsules*, its texture, and other circumstances, led me rather to comprehend these plants in the new genus *Cyathea*. This measure has not been approved; and the universal opinion being against me, I so far submit. I cannot however agree with those, whether competent to form an opinion or not, who have referred them to *Aspidium*, and I prefer the adoption of Prof. Bernhardt's genus *Cystopteris*; only retrenching the name as compounded of another established one, *Pteris*. Neither the genus nor its name having ever been received, such a necessary correction can cause no inconvenience. I wish the character given by this learned writer, and exhibited in his figure, were liable to no more exception; but even his original species, *C. fragilis*, has by no means constantly a bladder-like, ovate, pointed *cover*, split along one side, as he represents it. That part, though always at first wrapped about each *mass* of *capsules*, is, generally, but moderately concave; being soon turned aside, and, in a more advanced state, variously jagged. It has no central or petate mode of attachment, nor any transverse fissure, which characters belong to *Aspidium*.

1. *C. fragilis*. Brittle Bladder-fern.

Frond oblong-lanceolate, doubly pinnate; leaflets ovate, acute, pinnatifid, cut or serrated. Midribs bordered. Masses crowded. Cover irregularly torn.

Polypodium fragile. Linn. *Sp. Pl.* 1553. Huds. 459. Bolt. *Fil.* 50. t. 27 and 46. *Fl. Dan.* t. 401. Hoffm. in *Ræm. and Ust. Mag.* fasc. 9. 11. f. 14, a, b, c. Germ. v. 2, 9; excl. the reference to Dickson. Ehrh. *Crypt.* 151. Dicks. *Dr. Pl.* 15.

P. polymorphum D, fragile. Villars *Dauph.* v. 3. 847. t. 53. f.

P. album. Lam. *Franç.* v. 1. 21.

P. n. 1707. Hall. *Hist.* v. 3. 15; excl. the reference to Vaillant.

Cyathea fragilis. Sm. *Act. Taurin.* v. 5. 417. *Tracts* 253. *Fl. Br.* 1139. *Engl. Bot.* v. 23. t. 1587. *Roth Germ.* v. 3. 94.

Cystopteris fragilis. Bernh. in *Schrad. New Journ.* v. 1. p. 2. 27. t. 1. f. 9.

Aspidium fragile. Sw. *Syn. Fil.* 58. *Willd. Sp. Pl.* v. 5. 280. *Hook. Scot.* p. 2. 155.

Filix saxatilis, caule tenui fragili. Raii *Syn. ed.* 2. 50. *ed.* 3. 125. *Pluk. Almag.* 150. *Phyt. t.* 180. f. 5.

F. saxatilis non ramosa, nigris maculis punctata. Bauh. *Pin.* 358. *Moris.* v. 3. 581. *sect.* 14. t. 4. f. 28.

Filicula fontana major, sive *Adiantum album filicis folio*. Bauh. *Pin.* 358; according to his herbarium, examined by Haller.

F. altera. Segu. *Veron.* v. 1. 70. t. 1. f. 1.

Adiantum album. Lob. *Ik.* 810. f.

A. filicinum aquaticum mollius minimum. Barrel. *Ik.* t. 432. f. 2.

Dryopteris alba. Ger. *Em.* 1135. f; but scarcely of Dodonæus.

On wet shady rocks, or old buildings, in the mountainous parts of Britain, abundantly.

Perennial. June, July.

Root tufted, scaly, with black fibres. Fronds several together from 4 to 10 or 12 inches high, lanceolate, pointed, smooth, of a full, though bright, green, doubly, or almost triply, pinnate. Stalk brown, or blackish, very brittle and juicy, occupying one-third, or nearly half, of the length of the whole, destitute of scales, except at its very base. The primary divisions, or leaves, are usually nearly opposite, acute, of a moderate length; leaflets mostly alternate, ovate, acute, or pointed, in barren fronds sometimes blunter; their base always tapering and decurrent; they are by no means linear or oblong, nor is their margin wavy, but copiously, deeply and sharply toothed, and their substance is firm; the larger and lower ones are deeply pinnatifid, their lobes resembling the upper leaflets. Masses numerous and crowded, globular; at first pale, but finally blackish and confluent, covering the whole back of the frond. Cover white, flaccid, membranous, concave, irregularly jagged and torn, sometimes lengthened out into an oblong point, but soon turned back, and obliterated, or forced off, by the swelling shining capsules, which, in an early state, are often quite black, though subsequently browner.

The application of Bauhin's synonym, adopted by Morison, as above, is strongly justified by the peculiar blackness of the capsules, contrasted, in an early state, with the white cover; though Morison's figure, which best agrees herewith, is referred by Dr. Withering to his *Polypodium rhæticum*, hereafter described. His citation of f. 8, instead of 28, caused me no little perplexity, but an examination of the plate may excuse him.

This Fern, raised from seed, according to the directions of Mr. Henry Shepherd of Liverpool, see *Trans. of the Hort. Soc.*

v. 3. 338, has thriven well, in a common garden pot, plentifully supplied with water, for above seven years. I sowed at the same time what appeared, if not another species, a striking variety, from Derbyshire also ; but the produce of both pots was precisely the same.

2. *C. dentata*. Toothed Bladder-fern.

Frond oblong-lanceolate, doubly pinnate ; leaflets ovate, obtuse, pointless, bluntly toothed, partly pinnatifid. Partial midribs bordered. Masses crowded ; finally confluent.

Polypodium dentatum. Dicks. *Crypt. fasc.* 3.1.t.7. *H. Sicc. fasc.* 5. 16. *With.* 776. *Hull* 238.

P. n. 1702. *Hull. Hist.* v. 3. 14 ? Yet perhaps not *Aspidium Pontederæ*, Willdenow's n. 124.

Cyathea dentata. *Fl. Br.* 1141. *Engl. Bot.* v. 23. t. 1588. *Davies Welsh Botanol.* 99.

Aspidium dentatum. *Sw. Syn. Fil.* 59. *Willd. Sp. Pl.* v. 5. 273. *Hook. Scot.* p. 2. 155.

Filicula alpina, foliolis rotundioribus et crenatis. *Segu. Veron. Suppl.* 54. t. 1. f. 2.

In the clefts of alpine rocks, in Scotland and Wales.

On rocks in the Highlands of Scotland. *Dickson*. At the foot of the walls of Castle Dinas Bran, Flintshire ; and at Llangollen, Denbighshire ; also in Anglesea. *Rev. H. Davies*. On Snowdon. *Mr. Griffith*.

Perennial. *July*.

Rather smaller than *C. fragilis*, but agreeing with it in texture, colour, and general aspect. *Root* tufted, small. *Frond* for the most part correctly bipinnate, a few of the lower *leaflets* only, in luxuriant specimens, being pinnate, or pinnatifid. The *leaflets* are exactly ovate, or rounded, obtuse, pointless, copiously and bluntly serrated, or toothed ; their ribs wavy ; their base not decurrent, though seated on a winged midrib. *Masses* prominent, at length entirely confluent, of a uniform, rich, chesnut brown. I do not perceive, in the younger ones, that peculiar blackness which is observable in the foregoing. The *cover* is short, jagged, concave. I have never seen it in an early state, before bursting.

Prof. Hoffmann, in his *Flora Germanica*, adverts to this plant under *C. fragilis*, but I think he possibly may never have seen a specimen. It does not answer to any of his figures of supposed varieties of that species, in Rœmer and Usteri's Magazine. The ovate shape, and indentations, of the *leaflets* are very characteristic, differing from all varieties of the *fragilis*, and still more from every other species, whether British or exotic.

3. *C. angustata*. Deep-cut Mountain Bladder-fern.

Frond oblong, doubly pinnate; leaflets lanceolate, decurrent, wavy, or pinnatifid, with linear, acute, partly cloven, segments. Masses scattered, permanently distinct.

Polypodium fragile angustatum. Hoffm. in Rœm. and Ust. Mag. fasc. 9. 11. f. 14. d.

P. tenue. Hoffm. Germ. v. 2. 9.

P. rhæticum. Dicks. H. Sicc. fasc. 1. 17. With. 780. Bolt. Fil. 80. t. 45.

P. polymorphum A, *rhæticum*. Villars' Dauph. v. 3. 846. t. 53. f. A. From the author, agreeing precisely with Mr. Dickson's specimens.

P. ilvense. Raii Syn. 117.

Cyathea fragilis β. Fl. Br. 1139; omitting the references to Ray and Plukenet, which belong to *Aspidium dumetorum*.

C. fragilis γ. Fl. Br. 1139.

Aspidium fragile β. Willd. Sp. Pl. v. 5. 281; omitting the syn. of Ray and Plukenet.

A. rhæticum. Willd. Sp. Pl. v. 5. 280; omitting the reference to Linnæus, and perhaps Swartz.

Filix pumila saxatilis altera. Clus. Hist. v. 2. 212. f. Pann. 706. f.

Filicula petræa mas. Ger. Em. 1142. f.

F. fontana major, sive *Adiantum album filicis folio*. Bauh. Pin. 358; according to the opinion of Linnæus.

In mountainous woods, or about shady rocks, on the loftiest hills of Scotland, Wales, and the north of England.

On shady rocks in Scotland. Dickson. Near Llanberis, North Wales. Mr. Lhwyd. Brought from Gordale in Craven, by the late Mr. Curtis, whose specimen, rightly named, is in my possession.

Perennial. June, July.

Root tufted, or somewhat creeping, black, with long fibres, and rusty scales. Fronds several, erect, twelve or fifteen inches high, of which the slender, blackish, smooth and naked stalk occupies more than one-third, sometimes nearly half; the midrib above is still more slender, and, like every other part, quite smooth, without any membranous border. Main wings, or leaves, bright green, from twelve to fifteen pair, of a moderate length, nearly opposite, taper-pointed; the lowermost rather shorter, and more remote from the next, than those about the middle of each frond; all pinnate, with a scarcely bordered midrib. Leaflets about ten at each side, alternate, lanceolate, decurrent, rather bluntly pointed, sometimes tapering at the extremity; all either deeply pinnatifid, with oblong, acute, wavy segments; or, in less luxuriant plants, slightly pinnatifid,

or only wavy at the margin; the ribs of all more or less wavy. The ultimate divisions, in every instance, are oblong or linear, never dilated, rounded, or ovate; they are sometimes, though seldom, notched or cloven at the end. By this linear, or oblong, mode of division, and its thinner more pliant texture, the present species may readily be known from both the preceding, with which it has generally been confounded. The *masses of capsules*, much smaller, and less prominent, than in those species, always continue distinct, standing either solitary or in pairs, towards the bottom of each lobe or tooth, and are round, at first pale, subsequently brown. *Cover* white, very thin, concave, irregularly torn, soon pushed off, or turned aside, by the comparatively large, though far from numerous, shining brown *capsules*.

Great confusion has always existed amongst our British botanists concerning *Polypodium rhæticum*. Hooker has it not. Lightfoot appears by what he says in his *Fl. Scot.* 678, to have been acquainted, like Mr. Dickson, with our *Cystea angustata* under that name; and he quotes Gerarde rightly, justly objecting to Plukenet's *t.* 179. *f.* 5. Lightfoot's description is excellent, though he submits, as I have formerly done, to Haller, Weis, and others, who consider it as a variety of our *C. fragilis*. The late Mr. Davall took it for Haller's *n.* 1705; but that plant, with many errors in the synonyms, is certainly *Aspidium dilatatum*. Our *Cystea angustata* may be *n.* 1708 of Haller, but his references are confused. Mr. Hudson, on seeing Mr. Davall's specimens of the Fern in question, declared it very different from his own *Polypodium rhæticum*, which indeed is *Aspidium dumentorum*. I have little scruple in referring the obscure and long-disputed figure of Clusius, reprinted in Gerarde, as above quoted, to this *Cystea angustata*, though the draughtsman has omitted the ultimate divisions of the *leaflets*, well enough expressed by Hoffmann and Villars. I have never received this Fern from Wales, but if it be not Ray's *Polypodium ilvense*, it is wanting in the *Synopsis*. The wooden cut of Dalechamp, copied in J. Bauhin, and quoted doubtingly by Ray, should rather seem to be the totally different *Acrostichum Marantæ*, as Bauhin himself suspected.

4. *C. regia*. Laciniated Bladder-fern.

Fronde lanceolate, doubly pinnate; leaflets deeply pinnatifid, with oblong, blunt, partly notched segments. Partial stalks winged. Masses numerous, scattered, permanently distinct.

Polypodium regium. *Linn. Sp. Pl.* 1553; according to *Cliffort's Herbarium*. *Hull* 240.

P. n. 9. *Linn. Hort. Cliff.* 475.

P. trifidum. *With.* 779.

P. polymorphum C, *regium*. *Villars Dauph. v. 3. 847. t. 53. f. C.*

P. album β. *Lam. Franç. v. 1. 21.*

Cyathea regia. *Forst. in Sym. Syn. 194. Fl. Br. 1140.*

C. incisa. *Engl. Bot. v. 3. t. 163.*

Aspidium regium. *Sw. Syn. Fil. 58. Willd. Sp. Pl. v. 5. 281. Hook. Scot. p. 2. 155.*

Adiantum nigrum, *pinnulis cicutarie divisurâ*. *Raii Syn. ed. 2. 50. ed. 3. 126.*

A. album tenuifolium, *Rutæ murariæ accedens*. *Bauh. Hist. v. 3. p. 2. 735. f.*

Filicula cambrobritannica, *pinnulis cicutarie divisurâ donatis*. *Moris. v. 3. 581. n. 31.*

F. regia, *fumariæ pinnulis*. *Vaill. Par. 52. t. 9. f. 1; omitting the reference to Pona.*

On walls, as well as on lofty alpine rocks, but rare.

On a wall at Low Layton, Essex, plentifully. *Mr. T. F. Forster.*

Upon Snowdon. *Mr. Lhwyd.* Found there by the *Rev. H. Davies*, and *Mr. W. Wilson.* About Cwm Idwell. *Mr. Griffith.* On Scottish mountain of Ben Lawers; *Mr. Maughan. Hooker.*

Perennial. *June.*

Root tufted, scaly. *Fronde*s several, from three to ten or twelve inches high, bright green, lanceolate, twice pinnate, pinnatifid and finely cut, of a most elegant appearance, quite smooth in every part, except a few membranous, torn, pointed, brown scales, at the very bottom of the *stalk*, which is less brittle and juicy than that of *C. fragilis*. *Leaves* and *leaflets* more generally alternate than opposite; the former with a narrowly winged, or bordered, midrib; the latter ovate, obtuse, deeply pinnatifid, with elliptic-oblong, obtuse, partly cloven or notched segments, but not elongated, linear, or wavy at the margin like *C. angustata*, neither are their ribs zigzag as in that species. *Masses* of *capsules* very copious, but small, pale, scattered, not crowded, nor do they appear ever to become confluent. In a young state, each is wrapped up in a white, membranous, concave *cover*, terminating in a tapering, more or less jagged, point, nearly agreeing with *C. fragilis*, but the *masses* are much smaller, and the *capsules* of a pale brown, never black.

The lowland station of this Fern, close to a much-frequented road at Low Layton, where I have, in company with the late Mr. Forster, seen it covering great part of a brick wall, may be supposed analogous to its places of growth in France; but we seek in vain for any information on this head either in Vaillant or Lamarck, nor is it evident that the latter ever found the plant. The wall at Layton has been repaired, and the Fern almost destroyed. On Snowdon it is said to be very scarce, though Mr. Wilson, with his usual bounty, has sent me an ample supply of specimens of various sizes. He describes it as "varying

greatly in size and appearance, but always distinct from the *fragilis*." The *cover*, as that gentleman remarks, "is in both species, connected with the *frond* by its base only, at the lower side of the *mass of capsules*, that is, on the side next the base of the segment of the *leaflet*;" which agrees with my observations. This Fern is well compared by Bobart, in Morison, to the *Cicutaria* of old authors, our *Chærophyllyum sylvestre*, see v. 2. 48, so common on banks in the spring. It is unquestionably distinct from every other British Fern, though the proper name and synonyms were not discovered till after its appearance in *Engl. Bot.*, where I fell into the same error with some foreign botanists. Linnæus once thought it a Swedish plant, but erroneously, nor had he an original or authentic specimen.

The remarks of Dr. Richardson, inserted between brackets, by Dillenius, in the third edition of Ray's *Synopsis*, 126. n. 8, certainly do not answer to the present species; as my late friend the Rev. Hugh Davies, an excellent observer, first pointed out to me.

John Bauhin's synonym, which Ray quoted with doubt, appears, by the really excellent figure, to be unquestionably our plant. It must be either this or *Aspidium alpinum*, Willd. n. 139. which is likewise a *Cystea*, figured in *Jac. Ic. Rar. t. 642*, and in *Segu. Veron. Suppl. t. 1. f. 3*. But neither the plant itself, nor either of these representations, suits the wooden cut of Bauhin, which agrees far better with *C. regia*, particularly in the shape of the *leaflets*. Haller, very unsuitably I think, refers it to *Pteris crispa*; which circumstance, and the singular jumble of synonyms under his n. 1707, *Cystea fragilis*, induces a suspicion that he had not accurately observed these alpine ferns, and especially that he had never seen Vaillant's *Filicula regia* at all.

466. ASPLENIUM. Spleenwort.

Linn. Gen. 560. Juss. 15. Fl. Br. 1126. Sm. in Act. Taurin. v. 5.

409. Tracts 233. Swartz. Syn. Fil. 74. Lam. t. 867. f. 1, 3.

Spreng. Crypt. f. 23.

Trichomanes. Tourn. t. 315.

Ruta muraria. Tourn. t. 317.

Hemionitis. Tourn. t. 322. f. B.

Nat. Ord. see n. 463.

Masses of capsules linear or oblong, straight, parallel, scattered obliquely over the back of the *frond*, more or less numerous, between the midrib of each leaflet, or lobe, and the next rib or vein.

Cover membranous, continuous, straight, flat, linear, or oblong, broadest at the base, proceeding from a vein,

and separating at the opposite margin, towards the next midrib, or vein, of the leaf, leaflet, or lobe, not towards the outer edge of the same. *Caps.* numerous, stalked, globose; each of 1 cell, and 2 equal, hemispherical valves, bound together by a transverse, jointed *ring*, which when dry separates them by its elasticity. *Seeds* numerous, roundish, very minute.

Herbaceous. *Root* either tufted or creeping, blackish, with strong fibres; sometimes scaly. *Fronde* erect, mostly stalked, either simple, or variously pinnate, or branched; notched or serrated, rarely entire; generally of a firm texture, and smooth, not scaly. *Caps.* brown, or tawny. *Cover* pale, permanently straight, always having a rib or vein between the edge, at which it separates from the *frond*, and the outer margin of its lobe or leaflet, whether the outline of such be complete or not. By this mark *Asplenium* is always to be distinguished, with due attention, from *Darea*, of which there is no British species.

1. *A. Trichomanes*. Common Maidenhair Spleenwort.

Frond linear, pinnate; leaflets roundish-ovate, crenate. Midrib coloured, polished; keeled underneath.

A. Trichomanes. *Linn. Sp. Pl.* 1540. *Willd. v.* 5. 331. *Fl. Br.* 1126. *Engl. Bot. v.* 8. *t.* 576. *Hook. Lond. t.* 156. *Scot. p.* 2. 155. *Woodv. t.* 204. *Bolt. Fil. 22. t.* 13. *Fl. Dan. t.* 119. *Bull. Fr. t.* 185. *Dicks. H. Sicc. fasc.* 4. 17. *Ehrh. Pl. Off.* 170. *Crypt.* 221. *A. n.* 1693. *Hall. Hist. v.* 3. 9.

Trichomanes. *Raii Syn.* 119. *Fuchs. Hist.* 796. *f.* *Ic.* 460. *f.* *Matth. Valgr. v.* 2. 543. *f.* *Camer. Epit.* 925. *f.* *Cord. Hist.* 170. *f.* 1. *Trag. Hist.* 530. *f.* *Tillands. Ic.* 77. *f.*

T. mas. *Ger. Em.* 1146. *f.*

T. seu Polytrichum officinarum. *Bauh. Pin.* 356. *Moris. v.* 3. 591. *sect.* 14. *t.* 3. *f.* 10. *Plum. Fil. pref.* 26. *t.* B. *f.* 1. *Sibb. Scot. sect.* 2. 52. *t.* 3. *f.* 3.

β. T. foliis elegantè incisis. *Dill. in Raii Syn.* 120. *Tourn. Inst.* 539. *t.* 315. *f.* C.

Adiantum maritimum, segmentis rotundioribus. *Pluk. Almag.* 9. *Phyt. t.* 73. *f.* 6.

γ. Trichomanes aliud, foliis mucronatis profundè incisis. *Sibb. Scot. sect.* 2. 52. *t.* 3. *f.* 4.

On shady rocks, and old walls, frequent.

Perennial. *May—December.*

Root of many fibres. *Fronde* several, tufted, linear, simply pinnate,

scarcely a span high, with short smooth *stalks* of the same shining purplish black as the midrib, which is channelled in front, keeled at the back. *Leaflets* dark green, smooth, numerous, from thirty to sixty, nearly sessile, mostly opposite, small, roundish-ovate, bluntish, rarely pointed, unequally and slightly crenate; abrupt at the base, which is a little dilated, or pointed, at its upper edge. *Masses* six or eight on each leaflet, oblong, parallel to each other, but oblique with respect to the midrib, towards which their whitish wavy-edged *covers*, each originating from an obliquely transverse vein, open or separate, exposing the plentiful brown *capsules*.

The *leaflets* in β are somewhat cut or jagged; in γ more pointed. Sometimes the midrib is divided, or branched. No medical virtues are now attributed to this Fern, nor to any of its genus.

2. *A. viride*. Green Maidenhair Spleenwort.

Frond linear, pinnate; leaflets roundish-ovate, somewhat deltoid, crenate. Midrib flattened beneath.

A. viride. *Huds.* 453. *Willd. Sp. Pl.* v. 5. 332. *Fl. Br.* 1127. *Engl. Bot.* v. 32. t. 2257. *Hook. Scot.* p. 2. 155. *Bolt. Fil.* 24. t. 14. *Roth Germ.* v. 3. 56. *Fl. Dan.* t. 1289. *Dicks. H. Sicc. fasc.* 3. 18. *Ehrh. Crypt.* 71.

A. n. 1693 β . *Hall. Hist.* v. 3. 10.

Adiantum album. *Cord. Hist.* 172. f. 1; same cut as is used for the former species.

β . *Asplenium Trichomanes ramosum*. *Linn. Sp. Pl.* 1541. *Bolt. Fil.* 25. t. 2. f. 3.

Trichomanes ramosum. *Bauh. Hist.* v. 3. 747. f. *Lhwyd in Raii Syn. ed.* 2. 46. *ed.* 3. 119.

T. minus et tenerius. *Bauh. Pin.* 356. *Moris. sect.* 14. t. 3. f. 11.

T. minus, bifurcato pediculo, tenuioribus foliis dentatis. *Moris.* v. 3. 591.

On rocks, and old buildings, in mountainous countries.

On the loftiest rocks of Carnarvonshire very common, where the former is not to be found; also on the limestone rocks of Craven, Yorkshire. *Dr. Richardson*. On moist rocks in the mountainous parts of Yorkshire and Westmoreland. *Hudson*. On Ingleborough. *Mr. Crowe*. In the Highlands of Scotland in many places. *Lightfoot. Dickson. Hooker*.

Perennial. *June, July*.

Of the size and habit of the foregoing, but of a brighter green, with a pale or green rib, which is not very unfrequently divided, even as low as the naked part of the *stalk*, into two branches, making the *Trichomanes ramosum* of J. Bauhin. It is naturally however unbranched, though still *A. Trichomanes ramosum* of Linnæus; a bad name, to which Hudson's *viride* is vastly pre-

ferable. The main *rib* is flattened beneath, so as to be quadrangular; the *leaflets* are more generally alternate, more wedge-shaped at their base, somewhat pointed, and more deeply crenate, than in the common species. The *capsules* are rather paler, of a more yellowish, rusty hue.

3. *A. marinum*. Sea Spleenwort.

Fronde oblong, pinnate; leaflets ovate, oblique, serrated, obtuse; unequal and wedge-shaped at the base.

A. marinum. Linn. *Sp. Pl.* 1540. Willd. v. 5. 318. Fl. Br. 1128. Engl. Bot. v. 6. t. 392. Hook. Lond. t. 60. Scot. p. 2. 155. Bolt. Fil. 26. t. 15. Dicks. H. Sicc. fasc. 7. 17.

Chamæfilix marina anglica. Raii Syn. 119. Lob. Ic. 814. f. *Dalech. Hist.* 1226. f. *Moris. v.* 3. 573. sect. 14. t. 3. f. 25.

Filicula petræa fœmina, sive *Chamæfilix marina anglica*. Ger. Em. 1143. f.

Adiantum, sive *Filix trichomanoides*, &c. Pluk. Almag. 9. Phyt. t. 253. f. 5.

β. *A. trapeziforme*. Huds. 460; but not of Linnæus.

A. majus, coriandri folio. Sibb. Scot. sect. 2. 7. t. 3. f. 1, 2. Raii Syn. 124.

A. vero affine nostras minus, folio obtuso, saturatè viridi altius inciso. Sibb. Scot. sect. 2. 7. Raii Syn. 124; seems the same, or a trifling variety.

Upon maritime rocks, or in caves by the sea side.

In Anglesea and Wales; also in Sussex and other parts of the southern coast of England. Ray. In many places on the Scottish coast. Lightfoot. Near Hastings. Bishop of Carlisle. Not uncommon on the rocky coasts of Great Britain. Hooker.

β in the coves at Weems, Fifeshire. Sibbald. Lightfoot.

Perennial. June—October.

Root tufted, black and scaly, with many stout wavy fibres. Fronds several, erect, firm, oblong-lanceolate, from three to nine inches high, of which the dark-coloured naked stalk commonly makes one-third, or nearly so. The midrib has a thick, but not broad, border. Leaflets several, dark green, mostly alternate, somewhat stalked, of an irregular, oblong, obtuse, somewhat ovate figure, seldom an inch long; the base wedge-shaped, broadest, and often extended into a lobe, at the upper edge; the margin more or less crenate, or cut, throughout; the upper ones decurrent and confluent. Masses several, obliquely transverse, linear, obtuse, occupying the whole back of the leaflet, but not crowded, nor confluent; those towards the extremity very short. Cover uninterrupted, even, of a pale brown, opening towards the midrib of each leaflet. Capsules chesnut-coloured, observed by Dr. Hooker to be curiously reticulated.

The variety β , more deeply crenate and jagged than ordinary, sent from Scotland by Dr. Alston to P. Collinson, and assuredly what Sibbald has figured, was taken by Mr. Hudson for *Adiantum trapeziforme* of Linnæus. Sibbald's rude engravings may very well excuse this mistake; but the latter is a real *Adiantum*, copiously branched, well delineated in Sloane, Plukenet and Plumier, a native of the West Indies, not of Europe. The late Bishop of Carlisle has observed *Asplenium marinum* growing very luxuriantly in deep fissures of rocks; while, on the other hand, Mr. Lightfoot found it, in the eaves at Weems, just in the dwarf, though jagged, state exhibited by Sibbald.

4. *A. septentrionale*. Forked Spleenwort.

Fronde three-cleft; leaflets alternate, linear, jagged at the summit.

A. septentrionale. *Hull* 241. *Sw. Syn. Fil.* 75. *Willd. Sp. Pl.* v. 5. 307. *Fl. Br.* 1129. *Engl. Bot.* v. 15. t. 1017. *Hook. Scot.* p. 2. 155. *Lond. t.* 162. p. 158. *Hoffm. Germ.* v. 2. 12.

Acrostichum septentrionale. *Linn. Sp. Pl.* 1524. *Bolt. Fil.* 12. t. 8. *Fl. Dan.* t. 60. *Dicks. Dr. Pl.* 45. *Ehrh. Crypt.* 101.

A. n. 1714. *Hall. Hist.* v. 3. 17.

Scolopendrium septentrionale. *Roth Germ.* v. 3. 49.

Filix saxatilis Tragi. *Raii Syn.* 120. *Bauh. Hist.* v. 3. p. 2. 747. f. *Dalech. Hist.* 1226. f.

F. nuda seu saxatilis. *Trag. Hist.* 537. f; by mistake named *ar-borea*.

Muscus corniculatus. *Ger. Em.* 1561. f.

Holostium alterum, *Filix saxea* Tragi. *Lob. Ic.* 47. f.

In the dry rocky clefts of mountains, chiefly in the north.

On the mountains of Carnarvonshire. *Mr. Lhwyd*. In Edinburgh park. *T. Willisel*. On Ingleborough, Yorkshire. *Mr. Tofield*. Above Ambleside, Westmoreland. *Huds*. On Arthur's Seat, and at the Hermitage, by Blackford burn, near Edinburgh, abundantly, in 1782.

Perennial. *June—October*.

Root tufted, somewhat woody, with crooked fibres. *Fronde* innumerable, in broad dense patches, erect, three or four inches high, firm, smooth, of a dark dull green, each with a naked wiry *stalk*, a little dilated upwards, and terminating usually in three, rarely but two, alternate, stalked, narrow, linear, upright, pointed *leaflets*, jagged at the tips. The upper side of each is furrowed; the back clothed entirely, first with the long membranous *covers*, each originating from the disk, within the margin, at each side, and meeting over the *midrib*; and subsequently, after the spreading of these membranes, with the two confluent linear *masses* of crowded, dark-brown, *capsules*.

5. *A. alternifolium*. Alternate-leaved Spleenwort.

Frond pinnate; leaflets alternate, wedge-shaped, erect, notched at the extremity.

A. alternifolium. *Wulf. in Jacq. Misc. v. 2. 51. t. 5. f. 2. Murr. Syst. Veg. ed. 14. 933. Dicks. Tr. of Linn. Soc. v. 2. 290. Fl. Br. 1130. Engl. Bot. v. 32. t. 2258. Hook. Scot. p. 2. 156.*

A. germanicum. *Weis. Gott. 299. Willd. Sp. Pl. v. 5. 330. Hoffm. Germ. v. 2. 13. Ehrh. Crypt. 43.*

A. Breynii. *Retz. Obs. fasc. 1. 32. Sw. Syn. Fil. 85.*

A. n. 1690. Hall. Hist. v. 3. 8.

Scolopendrium alternifolium. Roth Germ. v. 3. 53.

Adiantum novum germanicum, rutæ murariæ facie. Breyn. Cent. 1. t. 97. Moris. v. 3. 585; but not sect. 14. t. 5. f. 25, as quoted by Willdenow.

Ruta muraria procerior germanica. Tourn. Inst. 541.

On rocky mountains, in the south of Scotland, rare.

On some sunny rocks, about two miles from Kelso, on the Tweed.

Mr. Dickson. Near Perth. Mr. Bishop.

Perennial. *June—October.*

An intermediate species between the preceding and the following, though perfectly distinct from both. *Root* tufted, black. *Fronds* numerous, from three to six inches high, smooth in every part, with blackish shining *stalks*; the leafy portion about equal to the stalk, lanceolate; *leaflets* alternate, stalked, of a narrow wedge-shaped figure; bluntish and notched at the summit; two or three of the lowermost slightly compound. *Masses* two or three on each leaflet, linear; their *covers* opening towards the main rib of the leaflet, or segment.

The nomenclature of this species, a native not only of Germany, but of Switzerland, Sweden and Scotland, evinces the folly of specific names taken from any particular country; but more especially the still greater folly of restoring old names, which had been laid aside on account of their badness, and long since forgotten.

6. *A. Ruta muraria*. Wall-rue Spleenwort.

Frond alternately twice compound; leaflets rhomboid-wedge-shaped, notched at the extremity.

A. Ruta muraria. Linn. Sp. Pl. 1541. Willd. v. 5. 341. Fl. Br. 1130. Engl. Bot. v. 3. t. 150. Hook. Scot. p. 2. 156. Bolt. Fil. 28. t. 16. Fl. Dan. t. 190. Bull. Fr. t. 195. Ehrh. Crypt. 231.

A. n. 1691. Hall. Hist. v. 3. 9.

Scolopendrium Ruta muraria. Roth Germ. v. 3. 52.

Ruta muraria. Bauh. Pin. 356. Raii Syn. 122. Ger. Em. 1144. f. Bauh. Hist. v. 3. p. 2. 745. f. Dod. Pempt. 470. f. Plum. Fil. pref. 29. t. A. f. 3.

Salvia vita, sive Ruta muraria. Lob. Ic. 811. f. Dalech. Hist. 1213.

Saxifraga. Fuchs. Hist. 730. f.

Saxifragum, seu Empetrum. Fuchs. Ic. 424. f.

Capillus Veneris. Brunf. Herb. v. 1. 219. f.

Trichomanes. Cord. Hist. 170. f. 2.

Paronychia. Matth. Valgr. v. 2. 388. f. Camer. Epit. 785. f.

Filicula petræa, rutæ facie. Moris. v. 3. 585. sect. 14. t. 5. f. 22.

β . *Adiantum, an album tenuifolium, Rutæ murariæ accedens, J. B.?*
Raii Syn. ed. 2. 49. ed. 3. 123.

A. foliis minutim in oblongum scissis, pediculo viridi. Pluk. Almag. 10. Phyt. t. 3. f. 3.

On old walls, and in the moist shady fissures of rocks. Ray asserts that it dies whenever it gets upon burnt bricks.

Perennial. June—October.

Root tufted, dark brown. Fronds several, three or four inches high, of the colour and aspect of Rue leaves, each with a longish stalk; the upper part doubly pinnate, or rather twice ternate, the middle branch only being alternately pinnate. Leaflets stout, wedge-shaped, or partly rhomboid, stalked, spreading horizontally, or a little deflexed, the extremity abrupt, or rounded, unequally notched. Masses several, close together about the middle of each leaflet, and at length confluent, covering the whole of its under side. Cover pale, crenate. Capsules dark brown.

The variety β , delineated by Plukenet, I have not seen. This, according to Dillenius in Ray's *Synopsis*, is what Mr. Vernon gathered at Wambrise or Warbrise (perhaps Wambridge); but he justly suspects that Ray confounded with it some young plants of our *Cystea regia*. See the remarks upon that species, p. 303.

7. *A. Adiantum nigrum.* Black Maidenhair Spleenwort.

Frond somewhat deltoid, alternately thrice pinnate; leaflets lanceolate, sharpish, deeply serrated.

A. Adiantum nigrum. Linn. Sp. Pl. 1541. Willd. v. 5. 346. Fl. Br. 1131. Engl. Bot. v. 28. t. 1950. Hook. Scot. p. 2. 156. Bolt. Fil. 30. t. 17. Fl. Dan. t. 250. Roth Germ. v. 3. 57.

A. n. 1692. Hall. Hist. v. 3. 9.

Adiantum nigrum Plinii. Lob. Ic. 810. f. 2.

A. nigrum officinarum. Raii Syn. 126. Bath. Hist. v. 3. p. 2. 734. no f. (Not 743, as in Ray and Haller.)

A. foliis longioribus pulverulentis, pediculo nigro. Bauh. Pin. 355. Moris. v. 3. 588. sect. 14. t. 4. f. 16.

Onopteris mas. Ger. Em. 1137. f.

Dryopteris nigra. Dod. Pempt. 466. f. Dalech. Hist. 1228. f.

Filix pumila petræa nostras, Adianti nigri foliorum æmula, sax-

orum interveniis prorumpens. *Pluk. Amalth.* 91. *Dill. in Raii Syn.* 127; a young plant only.

- β. *F. minor longifolia*, tarsiis raris, pinnulis longis, tenuissimis et oblongis laciniis fimbriatis. *Sherard in Raii Syn. ed.* 2. 51. *ed.* 3. 127. *Pluk. Mant.* 78. *Phyt. t.* 282. *f.* 3. *Herb. Sherard.*

In dry shady hedge bottoms, and about the roots and mossy trunks of old trees, as well as on rocks and old walls, common.

- β. In a dark cave among the mountains of Mourne, County of Down, Ireland. *Sherard.*

Perennial. *June—October.*

Much larger than the foregoing. *Root* tufted. *Fronde* several, about a foot high; their *stalks* scaly at the base; the leafy part smooth, deltoid; taper-pointed, as are all the primary divisions; smooth, firm, erect, doubly, or when perfect triply, pinnate, in an alternate order. *Leaflets* lanceolate, tapering at the base and somewhat stalked, deeply and sharply serrated, or notched, in the upper part; their colour a darkish shining green; the *stalk* purplish brown, polished. *Masses* oblong, numerous, ranged alternately in close central rows, with white, entire, conspicuous covers. *Capsules* chesnut-coloured.

Sherard's original specimen of the variety β, preserved in his herbarium at Oxford, is truly elegant, of a delicate membranous texture, the *leaflets* palmate, finely laciniated. *Plukenet's* figure by no means does it justice. No fructification is discernible.

Sibbald, in his *Scotia Illustrata*, *sect.* 2. 7. *t.* 4. *f.* 1, describes what he terms a larger kind of this common *Adiantum nigrum*; but by the figure no difference is discernible.

8. *A. lanceolatum*. Green Lanceolate Spleenwort.

Fronde lanceolate, doubly pinnate; leaflets and segments obovate, deeply and sharply toothed. Principal midrib not bordered.

A. lanceolatum. *Huds.* 454. *Sw. Syn. Fil.* 83. *Willd. Sp. Pl.* v. 3. 346. *Fl. Br.* 1132. *Engl. Bot.* v. 4. *t.* 240. *Forst. Tonbr.* 120.

Filix elegans, *Adiantum nigro accedens*, segmentis rotundioribus. *Raii Syn. ed.* 2. 51. *ed.* 3. 127.

Dryopteris candida. *Dod. Pempt.* 465. *f.* *Ger. Em.* 1135; same *f.*

Filicula fontana major, sive *Adiantum album filicis folio*. *Tourn. Inst.* 542; omitting the synonyms of the *Bauhins*.

On rocks and old walls in the south of England.

Upon rocks on the north side of the isle of Jersey. *Sherard.*

Plentiful about St. Ives, and in other parts of Cornwall. *Huds.* At Tonbridge Wells. *Mr. Dickson.* On the High Rocks, and in several other places about Tonbridge. *Forster.* In the north porch of Adderbury church, Oxfordshire. *Bobart.*

Perennial. *June—October.*

Root tufted, black, scaly. *Fronde*s usually about half the size of the last, with shorter stalks, smooth, of a fine grass green, which often remains uninjured in the dried specimens; their outline lanceolate, not deltoid, the lowermost wings being shorter than those about the middle of the frond, and rather more distant, as well as more disposed to be opposite; all of them are pinnate, or partly pinnatifid; the leaflets, or their segments, obovate, obtuse, tapering at the base, deeply and acutely serrated at the extremity, with pointed or bristly teeth, and branching veins. *Masses* several, short, elliptic-oblong, crowded about the middle of each leaflet or lobe, and after a while confluent, spreading nearly over the whole. *Cover* oblong, whitish, with a jagged margin, always separating at the side towards the midrib. *Capsules* prominent, of a rusty brown.

A very distinct and handsome species, little known except in some parts of England and France. In an advanced state the aggregate masses of capsules become roundish, so that, without an examination of the covers, the plant might be taken for a *Polypodium* or *Aspidium*.

9. *A. fontanum*. Smooth Rock Spleenwort.

Frond linear-lanceolate, doubly pinnate; leaflets and segments wedge-shaped, deeply and sharply toothed. General and partial midribs bordered throughout.

Aspidium fontanum. Sw. *Syn. Fil.* 57. Willd. *Sp. Pl.* v. 5. 272. *Engl. Bot.* v. 29. t. 2024.

A. Halleri. Willd. v. 5. 274.

Polypodium fontanum. Linn. *Sp. Pl.* ed. 1. 1089. ed. 2. 1550; with the descriptions and synonyms. *Herb. Linn. Fl. Br.* 1114. Huds. 456. *Bolt. Fil.* 38. t. 21. Leers 225. Villars *Dauph.* v. 3. 849. Gouan. *Illustr.* 80.

P. n. 1706. Hall. *Hist.* v. 3. 15.

Filicula saxatilis, omnium minima, elegantissima. Tourn. *Inst.* 542; according to his herbarium. Pluk. *Almag.* 150. *Phyt.* t. 89. f. 3.

F. fontana. Tabern. *Kreuterb.* 1181. f.

Adiantum filicinum durius crispum minimum. Barrel. *Ic.* t. 432. f. 1.

A. album. Lob. *Ic.* 810. f. 1.?

Dryopteris. Dalech. *Hist.* 1228. f.?

On shady old walls, or rocks, very rare.

On Amersham, or Agmondesham, church, Bucks, found by a Mr. Bradney, according to Hudson, and from whence it was brought alive to Kew garden, by the late Mr. Aiton, from whom I have a specimen; but the church has been whitewashed, and the plant destroyed. Mr. Hudson gathered the same in a stony situation near Wybourn, in Westmoreland; or rather perhaps Wiborn in Cumberland.

300 CRYPTOGRAMIA—FILICES. *Scolopendrium*.

Perennial. *June—September*.

A most elegant little Fern, with a large tufted black *root*, of many long smooth fibres, the crown slightly scaly. *Fronde* several, erect, from two to six inches high, very smooth, of a light, somewhat glaucous, green, linear-lanceolate, narrow, taper-pointed, of a firm texture, doubly and copiously pinnate; leaves alternate, broadest at their base, pinnate, or in the smaller specimens pinnatifid; *leaflets*, or *lobes*, obovate, with from two to four deep, broad, sharp, spreading, partially spinous, teeth, or lobes, so as to be in some measure palmate; their veins branching. *General* and *partial stalks* all equally winged throughout; the former bearing a few narrow pointed scales at the very bottom only. *Masses* mostly solitary on the ultimate lobes or leaflets, short, roundish-oblong. *Cover* oblong, firm, white, durable, broad at the base, originating from the midrib of the lobe, or incomplete leaflet, separating towards the next principal rib, and not towards the margin. *Capsules* numerous, prominent, of a rusty brown.

There is certainly a very strict relationship between this Fern and the last, both belonging to the genus *Asplenium* on account of the oblong shape of the *cover*, attached by its broad base to the midrib of some leaflet or lobe, and remaining unaltered in shape, as well as insertion. Whereas the *cover* of every *Aspidium*, though sometimes oblong at first, soon becomes lunate, or even orbicular, attached by a small or narrow point only, of which *Aspidium Filix femina* is the most remarkable example. On this subject, though long misled by the vague ideas of others, I have endeavoured at last to be correct. The intelligent reader will be able to trace my errors, and if any yet remain, will perhaps still further correct me. Professor Willdenow, though by far the best botanist in this department, appears to have made some mistakes, nor can I discern the grounds on which his *Aspidium Halleri* is separated from the *fontanum*, unless by the latter he understood our *Woodsia hyperborea*, as I once, but erroneously, supposed Swartz had done.

The name *fontanum*, taken from Tabernæmontanus, is perhaps not very suitable to this species, which, though it grows in shady spots, does not appear to be stationed near fountains or rivulets; nor may the synonym of that old writer be absolutely certain, though his figure is not unlike. Of the synonyms of Tournefort and Haller there is no doubt, and whatever may be thought of its genus, I trust this species can never hereafter be mistaken.

467. SCOLOPENDRIUM. Hart's-tongue.

Sm. Act. Taurin. v. 5. 410. t. 9. f. 2. Tracts 236. t. 1. f. 2. Fl. Br. 1133. Sw. Syn. Fil. 89. Willd. Sp. Pl. v. 5. 348. Spreng. Crypt. f. 25.

Ceterach. Willd. Sp. Pl. v. 5. 136.

Asplenium. *Lam. t. 867. f. 2. Tourn. t. 318.*

Lingua cervina. *Tourn. t. 319, 320.*

Hemionitis. *Tourn. t. 322. f. A.*

Nat. Ord. see *n.* 463.

Masses of capsules linear, or somewhat oval, straight, in numerous pairs, scattered obliquely over the back of the *frond*, each pair between two parallel veins. *Covers* membranous, superficial, continuous, linear, their edges folding longitudinally over the *capsules*, finally separating and erect, or spreading in contrary directions. *Caps.* numerous, stalked, globose, of 2 equal concave valves, bound together by a transverse jointed ring, as in the foregoing genera. *Seeds* numerous, minute.

Roots tufted. *Fronde*s simple, leathery; undivided or lobed; smooth on both sides, or scaly at the back.

1. *S. vulgare.* Common Hart's-tongue.

Frond oblong, smooth; heartshaped at the base. Stalk shaggy.

S. vulgare. *Sym. Syn.* 193. *Fl. Br.* 1133. *Engl. Bot. v. 16. t. 1150. Hook. Scot. p. 2. 156.*

S. officinarum. *Sw. Syn. Fil.* 89. *Willd. Sp. Pl. v. 5. 348.*

Scolopendrium. *Brunf. Herb. v. 2. 40. f.*

S. Phyllitis. *Roth. Germ. v. 3. 47.*

Scolopendria vulgaris. *Trag. Hist.* 549. *f.*

Asplenium Scolopendrium. *Linn. Sp. Pl.* 1537. *Huds.* 452. *Curt. Lond. fasc. 1. t. 67. Bolt. Fil.* 18. *t. 11. Woodv. suppl. t. 272. Bull. Fr. t. 167. Ehrh. Crypt.* 111.

A. n. 1695. *Hall. Hist. v. 3. 10.*

Phyllitis. *Raii Syn.* 116. *Ger. Em.* 1138. *f. Matth. Valgr. v. 2. 186. f. Camer. Epit.* 579. *f. good. Dalech. Hist.* 1219. *f. Cord. Hist.* 112. 2. *f.*

Ph. vulgaris. *Clus. Hist. v. 2. 213. f.*

Hemionitis. *Fuchs. Hist.* 294. *f. Ic.* 168. *f.*

Lingua cervina vulgaris. *Moris. v. 3. 556. sect. 14. t. 1. f. 1; with varieties, f. 2, 5, 8, 9.*

L. cervina officinarum. *Plum. Fil. pref.* 34. *t. A. f. 4.*

β. Phyllitis multifida. *Ger. Em.* 1138. *f. Raii Syn.* 117.

Ph., Lingua cervina officinarum, et perperam Scolopendria. *Lob. Ic.* 805. *f.*

On moist rocks, shady banks, old walls, the insides of wells, deserted mines, or other caverns, where there is a current of cold damp air, frequent.

Perennial. *July.*

Root tufted, or slightly creeping. *Fronde*s numerous, tufted, erect,

twelve or eighteen inches high, stalked, lanceolate, acute, of a full grass green, entire, or somewhat wavy, smooth, except the *stalk*, and back of the *midrib*, which are shaggy with narrow membranous scales; the base heartshaped, but not dilated in breadth; the summit occasionally cut into a number of segments, more or less deep; sometimes the margin is considerably crisped and jagged. *Masses* of fructification chiefly about the upper half of each frond, obliquely transverse, parallel, various in length, either quite linear and narrow, or shorter and broader, slightly elliptical, tumid, of innumerable small brown *capsules*, the linear, uninterrupted, membranous *covers*, which in an early state had folded over them, remaining, one at each side, nearly erect.

When bruised, the whole plant has a nauseous scent; to the taste it is mucilaginous and acrid. The medical virtues formerly attributed to this Fern being now entirely disregarded, I prefer its old appellation, *vulgare*, as a specific name, to a more modern one which might lead to an erroneous idea of its use in medicine.

2. *S. Ceterach*. Scaly Hart's-tongue. Rough Spleenwort.

Frond pinnatifid; scaly at the back.

S. Ceterach. *Sym. Syn.* 193. *Fl. Br.* 1134. *Engl. Bot.* v. 18. t. 1244. *Roth Germ.* v. 3. 48.

Scolopendrium. *Cord. Hist.* 171. 2. f.

Scolopendria vera. *Trag. Hist.* 551. f. *Tabern. Kreuterb.* 1191. f.

Ceterach officinarum. *Willd. Sp. Pl.* v. 5. 136. *Bauh. Pin.* 354.

Grammitis Ceterach. *Sw. Syn. Fil.* 23. *Hook. Scot.* p. 2. 153.

Asplenium Ceterach. *Linn. Sp. Pl.* 1538. *Huds.* 452. *Lightf.* 661.

Sibth. 414. *Bolt. Fil.* 20. t. 12. *Bull. Fr.* t. 383. *Ehrh. Crypt.* 211.

A. n. 1694. *Hall. Hist.* v. 3. 10.

A. sive Ceterach. *Raii Syn.* 118. *Ger. Em.* 1140. f. *Bauh. Hist.* v. 3. p. 2. 741. f. *Moris.* v. 3. 561. sect. 14. t. 2. f. *Plum. Fil.* pref. 33. t. B. f. 3.

A. vulgare. *Barrel. Ic.* t. 1043.

A. Scolopendria. *Lob. Ic.* 807. f.

Asplenium. *Matth. Valgr.* v. 2. 251. f. *Camer. Epit.* 640. f. *Dalech. Hist.* 1215. f.

On limestone rocks, or old walls.

Plentiful about Bristol, as *Ray* observed; especially about the Hot Wells, and on old walls between that place and the Severn. At Malham, Yorkshire, and in Wales. *Richardson*. On Heydon church, Norfolk. *Rev. H. Bryant*. At Nunney, Somersetshire. *Bishop of Carlisle*. On the hill of Kinnoul, Perthshire. *Lightf.* I have specimens from thence. In the north of England the plant is far from uncommon.

Perennial. *At almost all seasons.*

Root fibrous, black, tufted; scaly at the crown. *Fronds* numerous, tufted, spreading, from three to six inches high, leathery, oblong, bluntish, deeply and bluntly sinuated in an alternate order, the margin entire; upper surface smooth, of a deep, slightly glaucous, opaque green, with a scaly midrib, but no apparent veins; under thickly clothed with lanceolate, acute, membranous, rusty scales. *Stalks* hardly one-fourth the length of the whole. *Masses* oblong, in two obliquely transverse rows on each lobe, imbedded in the scales of the frond. *Covers* one at each side of each mass, as in the preceding species, erect, membranous, continuous, undulated, entire, quite distinct from the pointed separate scales.

I cannot ascertain whether the lines of *capsules* are originally double as in *Scolopendrium vulgare*, but the *covers* are evidently such as to leave no doubt of the genus, answering exactly to Tournefort's figure, which Swartz and Willdenow surely did not examine. The latter indeed has well removed this Fern from *Grammitis*, to which it has no natural affinity.

468. BLECHNUM. Hard-fern.

Linn. Gen. 560. *Juss.* 15. *Fl. Br.* 1135. *Act. Taurin.* v. 5. 411. *Tracts* 237. *Sw. Syn. Fil.* 113. *Willd. Sp. Pl.* v. 5. 407. *Lam.* t. 869. *Spreng. Crypt. f.* 34.

Struthiopteris. *Hall. Enum.* 132.

Nat. Ord. see n. 463.

Masses of *capsules* linear, narrow, straight, uninterrupted, parallel and close to the midrib, at the back of each segment of the fertile *fronds*, at each side. *Cover* membranous, linear, continuous, superficial, at a slight distance from the margin of the frond, separating at its inner edge, towards the rib. *Caps.* numerous, stalked, globose, of 2 valves, bound by a transverse jointed ring. *Seeds* numerous, minute.

Root tufted. *Fronds* numerous, erect, rigid, pinnatifid, or pinnate, the fertile ones narrowest.

1. *B. boreale*. Northern Hard-fern.

Frond smooth, pinnate, pectinate; leaflets linear, entire, scarcely dilated at the base.

B. boreale. *Sw. Syn. Fil.* 115. *Willd. Sp. Pl.* v. 5. 408. *Fl. Br.* 1135. *Engl. Bot.* v. 17. t. 1159. *Hook. Scot.* p. 2. 157.

Osmunda Spicant. *Linn. Sp. Pl.* 1522. *Curt. Lond. fasc.* 2. t. 67. *Bolt. Fil.* 8. t. 6. *Fl. Dan.* t. 99. *Hedw. Theor.* 43. t. 5. *Ehrh. Crypt.* 52.

Struthiopteris. *Cord. Hist.* 170. 2. f.

S. n. 1687. *Hall. Hist.* v. 3. 6.

Lonchitis aspera. *Raii Syn.* 118. *Ger. Em.* 1140. f.

L. aspera minor. *Matth. Valgr.* v. 2. 274. f. *Camer. Epit.* 665. f.

L. altera, folio polypodii. *Bauh. Hist.* v. 3. p. 2. 736. f. 737.

L. vulgatiore, folio vario. *Moris.* v. 3. 569. sect. 14. t. 2. f. 23.

Asplenon sylvestre. *Trag. Hist.* 550. f. *Dalech. Hist.* 1216. f.

In rough heathy or stony ground, or in moist shady hedge bottoms.

Perennial. *July.*

Root black and scaly, tufted, with many stout fibres. *Fronde* numerous, tufted, stalked, erect, straight, lanceolate, tapering at each end, smooth, deep green, a foot or more in height; the barren ones of numerous, close, parallel, lanceolate, entire, single-ribbed *leaflets*, bluntish with a minute point, their base scarcely at all dilated, or auricled; fertile ones interior, or central, not quite so numerous, but taller, of much narrower, rather more distant, more acute *leaflets*, dilated at the base. *Masses* in continuous, solitary, lines, close to each partial midrib, at each side. *Cover* at a small distance from the margin, uninterrupted, linear, wavy, separating after a while at the side next the rib, and disclosing the innumerable crowded brown *capsules*, each bound with a jointed ring.

Haller justly observed this could be no *Osmunda*. It is wonderful Linnæus, who founded the very natural well-marked genus *Blechnum*, never discovered that this Fern belonged to it; a fact first published in the Turin Memoirs above quoted.

469. PTERIS. Female-fern, or Brakes.

Linn. Gen. 559. *Juss.* 15. *Fl. Br.* 1136. *Act. Taurin.* v. 5. 412.

Tracts 241. *Sw. Syn. Fil.* 94. *Willd. Sp. Pl.* v. 5. 355. *Lam. t.* 869.

Spreng. Crypt. f. 26.

Filix. *Hall. Hist.* v. 3. 7.

Nat. Ord. see n. 463.

Masses of *capsules* linear, uninterrupted, parallel to, and near, the margin, at the back of each segment of the fertile *fronds*. *Cover* from the inflexed margin of the frond, membranous, continuous, uninterrupted, wavy, sometimes fringed, separating at its inner edge, towards the rib. *Capsules* numerous, stalked, globose, of 2 valves, bound by a transverse jointed ring. *Seeds* numerous, minute, slightly angular.

Root somewhat creeping. *Fronde* erect, mostly compound; in some foreign species simply pinnate; in a few undivided; segments of the barren ones broadest, and often crenate. In our first and most common species a mem-

branons, inflexed, narrow, inner *cover*, contrary or opposite to the outer one, and in like manner fringed, has been observed by the late Mr. Thomas Smith, F.L.S., as well as by Mr. Brown. This ought perhaps to form a part of the generic character of a true *Pteris*; those tropical, more membranous, species, which, according to Mr. Brown, have it not, constituting a separate genus. Yet I doubt its existence in *P. crispa*, which can be determined by those only who have opportunities of examining this rare mountain species in a growing state. See Hooker, *p.* 2. 156.

1. *P. aquilina*. Common Brakes.

Fronde thrice pinnate; segments lanceolate, bluntish; lowermost pinnatifid; upper gradually smallest; terminal ones large, undivided.

P. aquilina. Linn. *Sp. Pl.* 1533. Willd. *v.* 5. 402. Fl. Br. 1136. Engl. Bot. *v.* 24. *t.* 1679. Hook. Scot. *p.* 2. 156. Bolt. *Fil.* 16. *t.* 10; bad. Bull. Fr. *t.* 207. Ehrh. *Crypt.* 201.

Filix. Tillands *Ic.* 78. *f.*

F. n. 1688. Hall. *Hist.* *v.* 3. 7.

F. foemina. Raii *Syn.* 124. Ger. *Em.* 1128. *f.* Lob. *Ic.* 812. *f.* Matth. *Valgr.* *v.* 2. 627. *f.* Camer. *Epit.* 992. *f.* bad. Fuchs. *Hist.* 596. *f.* *Ic.* 342. *f.* Dod. *Pempt.* 462. *f.* Tabern. *Kreuterb.* 1181. *f.* Dalech. *Hist.* 1222. *f.*

F. ramosa major, pinnulis obtusis non dentatis. Bauh. *Pin.* 357. Plum. *Fil. pref.* 23. *t.* A. *f.* 1.

F. ramosa repens vulgatissima. Moris. *v.* 3. 583. *c.* 14. *t.* 4. *f.* 3.

F. majoris primum genus. Trag. *Hist.* 542. *f.*

β. F. saxatilis ramosa maritima nostras. Raii *Hist.* *v.* 1. 151. *Syn.* 125. Pluk. *Almag.* 155. Phyt. *t.* 182. *f.* 1.

On barren heaths, and in sandy thickets and woods, every where most abundantly. β. On maritime rocks, or damp walls in towns, but rarely.

Perennial. July.

Root long, tapering, creeping; externally black. Fronds annual, erect, from one to six feet high, repeatedly compound, with horizontally spreading *branches*, whose ribs are smooth; the primary ones nearly opposite; the next more alternate, deeply pinnatifid, with crowded, lanceolate, bluntish, convex, parallel segments; the odd one generally much the largest; lateral ones sometimes greatly diminished; all of a light bright green; revolute at the margin, which is brownish, and slightly crisped or wavy, sheltering the dense linear *masses* of tawny *capsules*. Barren *leaflets* pale and hairy at the back. The main stalk is

angular and sharp-edged, wounding the hands severely if plucked incautiously. When cut across, the pith has a branched appearance, resembling a spread-eagle, whence the latin name.

The variety β is singularly delicate, with rounded, more distant, barren leaflets or segments, and very slender stalks. Dillenius says it once grew on a wall in Chelsea garden, where by sending down roots into the ground, it acquired the proper appearance of this species.

This common Fern is impatient of severe cold in the spring, and its curled scaly shoots will scarcely bear any frost, though its natural situation is often the most exposed and bleak possible. The roots are generally killed by transplantation.

2. *P. crispa*. Curled, or Rock, Brakes.

Frond twice or thrice pinnate; barren leaflets wedge-shaped, cut; fertile elliptic-oblong, obtuse, convex.

P. crispa. Linn. *Ms. in his own Sp. Pl.* 1522. *With.* 764. *Hull* 243. *Fl. Br.* 1137. *Engl. Bot.* v. 17. t. 1160. *Hook. Scot.* p. 2. 156. *Willd. Sp. Pl.* v. 5. 395; omitting *J. Bauhin's* synonym, referred above to *Cystea regia*.

P. Stellcri. "Amman in the New Petersburg Trans. 12. t. 12. f. 1." Willdenow.

Osmunda crispa. Linn. *Sp. Pl.* 1522. *Huds.* 450. *Lightf.* 655. *Bolt. Fil.* 10. t. 7. *Fl. Dan.* t. 496.

Onoclea crispa. *Roth Germ.* v. 3. 39.

Adiantum album crispum alpinum. *Raii Syn.* 126.

A. album floridum. *Pluk. Almag.* 9. *Phyt. t.* 3. f. 2.

Filix botrytis minima, sive *Filicula petræa florida anglica*, foliis plurifariam divis. *Moris.* v. 3. 593. *sect.* 14. t. 4. f. 4.

In open stony mountainous situations.

On the sides of mountains in Westmoreland, Scotland and Wales, in dry stony ground, not uncommon.

Perennial. *July*.

Root moderately creeping, dark brown, with many fibres. *Fronds* annual, tufted, erect, smooth, from six to twelve inches high, of a bright pea-green hue, and an elegant feathery aspect; their *stalks* long, pale, polished. *Barren* ones twice or thrice pinnate, with small, wedge-shaped, obtuse, flat, alternate, stalked *leaflets*, more or less deeply notched, or jagged. *Fertile* rather taller, thrice pinnate, with elliptic-oblong, narrower, undivided, turgid, likewise stalked, *leaflets*, whose broad, brown, wavy, crenate, reflexed margins nearly meet over the midrib, and cover the two linear dense masses of capsules, which, as far as I can discern in dried specimens, are unaccompanied by any opposite or internal membrane.

A few species from the north-west coast of America, and from

New Holland, akin to this last, require to be well examined, before any thing can be concluded respecting the internal *cover* as an essential character of *Pteris*.

470. ADIANTUM. Maidenhair.

Linn. Gen. 560. *Juss.* 15. *Fl. Br.* 1138. *Act. Taurin.* v. 5. 414. *Tracts* 245. *Sw. Syn. Fil.* 120. *Willd. Sp. Pl.* v. 5. 427. *Tourn.* t. 317. *Lam. t.* 870.

Nat. Ord. see *n.* 463.

Masses of *capsules* roundish, marginal, somewhat terminal, distinct, at the back of the *frond*, each attached to the centre of the under side of its own membranous, rounded, reflexed *cover*, which proceeds from the margin of the *frond*, being unconnected at its inner edge. *Capsules* several, stalked, rather small, globose, of 2 valves, bound by a transverse jointed ring. *Seeds* very minute.

Roots tufted, or slightly creeping, scaly. *Fronde* generally repeatedly compound, rarely simple, for the most part smooth. *Leaflets* stalked, more or less wedge-shaped and entire at the base; bluntish and notched at the upper margin; of a firm texture, with fine radiating, or forked, veins. *Main stalks* and *branches* slender, elastic, polished, mostly blackish. *Covers* brown, pale-edged, flat; finally recurved.

Dr. Swartz first separated from *Adiantum* a few species, under the name of *Cheilanthes*, in which the *capsules* are situated upon the *frond*, as was always supposed to be the case in *Adiantum* itself; but it is otherwise in the original species. The difference indeed is often very hard to be discerned, the character of some species being rather ambiguous. Brown and Willdenow however have stamped this new genus with their weighty authority, and the former of these writers describes the disk of each *scale*, or *cover*, in *Adiantum*, where the *capsules* are inserted, as veiny, the unattached margin only being membranous.

1. *A. Capillus Veneris*. True Maidenhair.

Frond doubly compound; leaflets alternate, wedge-shaped, lobed, on capillary stalks. *Covers* transversely oblong.

A. Capillus Veneris. *Linn. Sp. Pl.* 1558. *Willd. v.* 5. 449. *Fl. Br.* 1138. *Engl. Bot. v.* 22. t. 1564. *Hook. Scot. p.* 2. 157. *Bolt. Fil.* 24. t. 29. *Jacq. Misc. v.* 2. 77. t. 7. *Bull. Fr. t.* 247. *Dicks. H. Sicc. fasc.* 6. 16.

A. n. 1713. *Hall. Hist.* v. 3. 17.

A. foliis coriandri. *Bauh. Pin.* 355. *Moris. v.* 3. 587. *sect.* 14. *t.* 5. *f.* 6.

A. magnum. *Trag. Hist.* 531. *f.*

A. nigrum. *Cord. Hist.* 172. *f.*

A. candidum. *Fuchs. Ic.* 46. *f.*

Adiantum. *Fuchs. Hist.* 82. *f.* *Matth. Valgr. v.* 2. 542. *f.* *Camer. Epit.* 924. *f.* *Dalech. Hist.* 1208. *f.*

A. sive Capillus Veneris. *Bauh. Hist. v.* 3. *p.* 2. 743. *f.* 744. *Lob. Ic.* 809. *f.*

Capillus Veneris verus. *Dill. in Raii Syn.* 123. *Ger. Em.* 1143. *f.*

On moist rocks and old walls, especially near the sea, but rare.

At Barry island, and port Kirig, Glamorganshire. *Mr. Lhwyd.*

In the isle of Arran, near Galloway. *Mr. Stonestreet, according to Sherard's herbarium.* Gathered in the south islands of Arran in 1805, by *Mr. J. T. Mackay.* Found by Prof. Beattie on the banks of the Carron, a rivulet in Kincardineshire. *Hooker.*

Perennial. *May—September.*

A most elegant *fern*, especially when it projects from the sides of upright dripping rocks, or caves. The *root* is slightly creeping, blackish, shaggy. *Fronds* from six to twelve inches high, rarely more in this country, erect or drooping, alternately and doubly pinnate; their *stalks* slender, of a purplish black, smooth and polished; the ultimate ones quite capillary, whence the name of Maidenhair, and of Capillary Herbs, subsequently extended to this whole Natural Order. *Leaflets* deep green, smooth, wedge- or fan shaped, very various in width; the base entire; upper, or outer, margin variously jagged and lobed; when barren sharply serrated; when fertile, as is most usual, each segment terminates in a roundish, reflexed, flat, brown *scale*, thin and pale at its edges, sometimes broader than long, usually supposed to cover the fructification seated on the frond; but Dr. Swartz first observed each round *mass* of *capsules* to be actually borne by the central part of this *scale*, or *cover*, underneath.

One species of this genus, *A. pedatum*, is principally used, in the south of France, to make a syrup, which being perfumed with orange flowers, is called *Capillaire*, and known by that name throughout Europe, as a refreshing beverage when diluted with water. Ray in his *Historia*, v. 1. 147, 148, attributes almost every possible medical virtue to the *Capillus Veneris*, (probably confounded with *A. pedatum*,) on the authority of a Montpellier physician.

471. WOODSIA. Woodsia.

Br. Tr. of Linn. Soc. v. 11. 170. *Sm. Comp. ed.* 4. 168.

Nat. Ord. see n. 463.

Masses of capsules roundish, convex, dispersed on the veins at the back of the *frond*. *Cover* membranous and slightly cup-shaped at the base, under each *mass*; the margin in many deep, capillary, obscurely jointed, taper-pointed segments, incurved over the *capsules*, permanent. *Capsules* several, stalked, crowded, without any prominent common *receptacle*, roundish-obovate, bound by a vertical jointed ring, and bursting (as it seems) irregularly at the sides. *Seeds* numerous, kidney-shaped.

A genus of small *ferns*, of which two species only have hitherto been discovered. These have been generally confounded either with *Acrostichum* or *Polypodium*. Their *roots* are fibrous. *Fronds* tufted, erect, stalked, pinnate, pinnatifid, clothed with simple hairs, or narrow pointed scales.

The name, given by Mr. Brown, justly commemorates Mr. Joseph Woods, F.L.S., an excellent practical English botanist, who first illustrated our native species of *Rosa*; see *vol.* 2. 369, and *Trans. of the Linn. Soc.* v. 12. 173.

1. *W. ilvensis*. Oblong Woodsia.

Leaflets oblong, deeply pinnatifid, with oblong segments.

W. ilvensis. *Br. Tr. of Linn. Soc.* v. 11. 173.

Acrostichum ilvense. *Linn. Sp. Pl. ed.* 1. 1071. *ed.* 2. 1528. *Fl. Suec. ed.* 2. 371. *Fl. Dan. t.* 391. *Ehrh. Crypt.* 191.

Polypodium ilvense. *Sw. Syn. Fil.* 39. *Willd. Sp. Pl. v.* 5. 198. "*Schkuhr Crypt.* 16. t. 19."

P. Marantæ. *Hoffm. Germ. v.* 2. 5; omitting the *syn.*

Lonchitis aspera ilvensis. *Dalech. Hist.* 1221. *f.*

Filix minor ilvensis, alis asplenii. *Moris. sect.* 14. t. 3. *f.* 22; but not the *descr.* v. 3. 576. n. 22.

Nephrodium lanosum. *Michaux Boreal.-Amer. v.* 2. 270. (not 198). On the authority of Mr. Brown.

On alpine rocks in Wales and the North of England.

Upon Glyder Vawr, near Llyn y Cwm, North Wales. *Mr. W. Wilson*. At the foot of the basaltic rocks, on the Durham side of the river Tees, about two hundred yards below Caldron Snout. *Mr. James Backhouse*. Near the summit of some very bold basaltic rocks, called Falcon Clints, about ten miles west of Middleton, Teesdale. *Mr. S. Hailstone*.

Perennial. *July—September*.

Mr. Wilson first determined this species when he gathered it in Wales, in 1824 and 1825; our English specimens having been sent under the name of the following; a very excusable error, when it is considered how nearly the plants are related. *Roots*

tufted, of numerous, long, smooth, blackish, simple fibres. *Fronde* several, tufted, erect, from three to five inches high; the slightly scaly, pale brown *stalk*, remarkably elastic and wiry, making about one-third of the whole. *Leaflets* from sixteen to twenty, nearly opposite, oblong, bluntly pointed, deeply pinnatifid, with segments of the same shape, slightly revolute at the margin, and somewhat wavy, scarcely crenate; the upper surface of a rather glaucous green, even, besprinkled with a few hairs, or slender tapering scales; under more densely scaly, nearly covered with fructification. *Masses* orbicular, crowded, slightly prominent, each of about six or seven roundish-ovate *capsules*, seated on a small, membranous, roundish *cover*, whose margin, as Mr. Brown first discovered, is fringed with very long, taper, jointed, hair-like segments.

Exotic specimens, especially those from North America, are larger than our's, but do not otherwise differ. When Linnæus first began to use specific names, he adopted that of *ilvense*, from the newly discovered synonym of Dalechamp, for this supposed *Acrostichum*, first observed in the isle of Elba (*Ilva*). This affords but an additional proof of the absurdity of such names, which when established, like the present, may be tolerated, but will never be imitated by any person who can contrive a better.

2. *W. hyperborea*. Rounded-leaved Woodsia.

Leaflets bluntly triangular, pinnatifid, with rounded segments.

W. hyperborea. *Br. Tr. of Linn. Soc.* v. 11. 173. *t.* 11. *Sm. Comp.* ed. 4. 174.

Polypodium hyperboreum. *Sw. Syn. Fil.* 39. *Willd. Sp. Pl.* v. 5. 197. *Engl. Bot.* v. 29. *t.* 2023.

P. arvenicum. *Fl. Br.* 1115. *With.* 774. *Sym. Syn.* 191. *Hull* 238.

P. ilvense. *With.* 774. *Hull* 237. *Sym. Syn.* 191.

Acrostichum hyperboreum. *Liljeblad in Stockh. Trans. for* 1793. 201. *t.* 8.

A. ilvense. *Huds.* 451. *Dicks. H. Sicc. fasc.* 8. 17.

A. alpinum. *Bolt. Fil.* 76. *t.* 42.

Filix alpina, *Pedicularis rubræ foliis subtus villosis*. *Raii Syn.* 118.

F. pumila, *Lonchitidis Maranthæ species*, *Cambrobritannica*. *Pluk. Almag.* 150. *Phyt.* *t.* 89. *f.* 5. *not* 8.

Filicula alpina tenerior, *alis latiusculis brevioribus integris, profundè dentatis*. *Moris.* v. 3. 576. *sect.* 14. *t.* 3. *f.* 23.

On alpine rocks in Wales and Scotland.

On a moist rock called Clogwyn y Garnedd, one of the highest points of Snowdon. *Dr. Richardson*. This rock wholly faces

the east, not the north-west. *Mr. W. Wilson.* On Ben Lawers, Scotland. *Mr. Dickson and Mr. G. Don.* Sent from Scotland, by *the Rev. Dr. Stuart.*

Perennial. *July.*

Rather smaller than the foregoing, and less upright, with a more rusty aspect. *Stalk* less elastic. *Leaflets* shorter, rounder, with more rounded lobes, and broader at the base, not quite so deeply pinnatifid. The two species appear to me very distinct, though similar.

472. TRICHOMANES. Bristle-fern.

Linn. Gen. 560. *Juss.* 16. *Sm. in Rees's Cycl.* v. 36. *Act. Taurin.* v. 5. 417. *Tracts* 255. *Sw. Syn. Fil.* 141. *Willd. Sp. Pl.* v. 5. 498. *Lam. t.* 871. *Spreng. Crypt. f.* 35.

Nat. Ord. see *n.* 463. .

Masses of *capsules* roundish, terminal, imbedded in the margin, or segments, of the *frond*. *Cover* urn-shaped, of the texture of the *frond*, and continuous with it, of one leaf, dilated upwards, and opening outwards, permanent. *Capsules* several, sessile, crowded at the base of a permanent cylindrical *common receptacle*, whose capillary naked point projects beyond the *cover*, each roundish, of 2 valves, bound by a vertical jointed ring.

A numerous genus of herbaceous *ferns*, with creeping, seldom tufted, *roots*, of many crooked *fibres*. *Frond* pellucid, veiny, either undivided, lobed, or copiously pinnatifid, with decurrent, entire or serrated, segments, the whole mostly of a dull or brownish green. *Covers* either forming a marginal series, or solitary at the ends of the segments, each terminating a rib, or vein; very rarely racemose and leafless. Natives of wet rocks, or trunks of trees, principally in tropical countries. We have only one species, which is extremely rare, and till lately has been greatly misunderstood.

1. *T. brevisetum*. Short-styled Bristle-fern.

Frond thrice pinnatifid, lobed, smooth; segments linear, entire. *Stalk* winged. *Covers* oblong. Common receptacles at first but slightly prominent.

T. brevisetum. *Br. in Ait. Hort. Kew. ed.* 2. v. 5. 529. *Sm. Comp. ed.* 4. 174.

T. europæum. *Sm. in Rees's Cycl.* v. 36.

T. alatum. *Hook. Lond. t.* 53.

312 CRYPTOGRAMIA—FILICES. Hymenophyllum.

T. pyxidiferum. *Huds.* 461. *Bolt. Fil.* 56. *t.* 30. *With.* 781. *Hull* 243.

T. Tunbridgense, var. 3. *With.* 782. *Hull* 244.

Hymenophyllum Tunbridgense β. *Fl. Br.* 1142.

H. alatum. *Engl. Bot.* v. 20. *t.* 1417. *Willd. Sp. Pl.* v. 5. 526.

Filix humilis repens, foliis pellucidis et splendentibus, caule alato. *Dill. in Raii Syn.* 127. *t.* 3. *f.* 3, 4.

In watery places, or on wet rocks, very rare.

At Belbank, scarce half a mile from Bingley, Yorkshire, at the head of a remarkable spring. *Dr. Richardson.* Found there, by *Mr. Dickson* and *Mr. R. Teesdale*, long afterwards, in a young state only, like *fig. 4.* Gathered, in fructification, upon rocks near the cascade, at the bottom of Turk mountain, Killarney, Ireland. *Mr. J. T. Mackay.*

Perennial. *May, June.*

The *root* is creeping, cylindrical, black and downy, with several, scattered, branched, vertical, stout, downy radicles. *Fronde* springing solitarily, here and there, from the upper side of the horizontal root, erect, four or five inches high, smooth, of a deep transparent green, ovate-oblong, about thrice alternately pinnatifid, with a winged *stalk*; the segments uniform, linear, single-ribbed, obtuse, entire, decurrent; a few of the uppermost terminating each in a solitary, imbedded, oblong or cylindrical, somewhat urn-shaped *cover*, continued from the leaf, slightly winged at the sides, a little dilated, not lobed, at the orifice. *Capsules* in a round *mass*, attached to the base of a cylindrical slender *receptacle*, or *column*, which in an early state does not project beyond the *cover*; but afterwards acquires three or four times the length of that part, and is nearly as prominent as in any other *Trichomanes*. The name of *alatum*, therefore, would have been far preferable to *brevisetum*, had it not been already applied by Willdenow to his 17th species.

473. HYMENOPHYLLUM. Filmy-fern.

Sm. Act. Taurin. v. 5. 418. *f.* 8. *Tracts* 256. *t.* 1. *f.* 8. *Sw. Syn. Fil.* 145. *Willd. Sp. Pl.* v. 5. 516. *Lam. t.* 870. *Spreng. Crypt. f.* 36.

Nat. Ord. see n. 463.

Masses of *capsules* roundish, terminal, imbedded in the segments of the *frond*. *Cover* somewhat orbicular, compressed, of the texture of the *frond*, and continuous with it, of 2 equal parallel valves, opening outwards, permanent. *Caps.* several, sessile, crowded at the base of a permanent, cylindrical, very short *common receptacle*, whose point does not project beyond the *cover*, each roundish, of 2 valves, bound by a vertical jointed ring. *Fronde* membranous and pellucid, like the last, much

branched, smooth, or sometimes downy, with solitary ribs, wiry *stalks*, and creeping slender *roots*. *Covers* solitary at the ends of some of the inferior and shorter segments, terminating the rib, entire or serrated. Natives of wet mossy rocks, or trunks of trees, most plentiful in tropical countries. One species only is of European growth.

1. *H. tunbridgense*. Tunbridge Filmy-fern.

Fronde doubly pinnatifid, smooth. Segments and covers sharply toothed. Fructifications solitary, from the lowermost of the secondary segments, at the upper edge.

H. tunbridgense. *Fl. Br.* 1141. *Engl. Bot.* v. 3. t. 162. *Willd. Sp. Pl.* v. 5. 520. *Sym. Syn.* 195. *Hook. Lond. t.* 71. *Scot. p.* 2. 157. *Trichomanes tunbridgense*. *Linn. Sp. Pl.* 1561. *Huds.* 461. *With.* 781. *Bolt. Fil.* 58. t. 31. *Fl. Dan. t.* 954.

Adiantum petraeum perpusillum anglicum, foliis bifidis vel trifidis. *Raii Syn. ed.* 2. 47. *ed.* 3. 123. *Hist.* v. 3. 77.

A. radicosum humi-sparsum; et erectius. *Pluk. Almag.* 10. *Phyt. t.* 3. f. 5, 6.

Darea tunbrigensis minor. *Petiv. Mus. cent.* 8. n. 762.

Muscus palustris anglicus, foliis integris, bifidis et trifidis, sparsim nascentibus. *Moris. v.* 3. 627. *sect.* 15. t. 7. f. 50.

M. montanus italicus, adianthi foliis. *Bocc. Mus.* 24. t. 2. f. 1.

Amongst moss, in watery shady places, in the rocky or mountainous parts of Great Britain.

Perennial. *May, June*.

The *roots* are long, slender, smooth, wiry, creeping horizontally. *Fronde* scattered, erect, about one-third the size of the *Trichomanes* last described, and like that, smooth, of a filmy pellucid texture, curling up as they dry; the *stalk* wiry, without any wing or border; segments linear, obtuse, single-ribbed, sharply toothed, especially in their upper part. *Covers* of two erect, converging, nearly orbicular, equal leaves, toothed in like manner, solitary at the base of the primary divisions, on the upper edge, with more or less of a stalk. Dr. Hooker's figures and history of this and the foregoing are peculiarly excellent.

Mr. Menzies brought the present plant from the Cape of Good Hope; and it grows in most parts of Europe, from Norway to Italy, but has not been observed in Germany or Switzerland.

** *Capsules, or seeds, without any distinct elastic ring.*
Habit various.

474. OSMUNDA. Osmund-royal.

Linn. Gen. 559. *Juss.* 15. *Fl. Br.* 1107. *Sw. Syn. Fil.* 160. *Willd. Sp. Pl.* v. 5. 96. *Br. Prodr.* 163. *Tourn. t.* 324. *Lam. t.* 865. f. 2.

Nat. Ord. *Filices*. Linn. 55. Juss. 5.

Capsules clustered, distinct, separately stalked, naked, nearly globular, striated with a protuberance but no ring, of 1 cell, and 2 incomplete, equal valves, bursting longitudinally, at one side. *Cover* none. *Seeds* numerous, minute.

Root tufted. *Fron*d doubly pinnate, entire or serrated. *Leaflets* partially changed to paniced dense clusters of small *capsules*.

1. *O. regalis*. Common Osmund-royal.

Leaflets oblong, nearly entire; dilated, and somewhat auricled, at the base. Clusters paniced, terminal.

O. regalis. Linn. *Sp. Pl.* 1521. Willd. v. 5. 97. *Fl. Br.* 1108. *Engl. Bot.* v. 3. t. 209. Hook. *Lond.* t. 150. *Scot.* p. 2. 158. *Bolt. Fil.* 6. t. 5. *Fl. Dan.* t. 217. *Ehrh. Crypt.* 42.

O. Filix florida. Lob. *Ic.* 813. *f.*

Filix ramosa, non dentata, florida. Bauh. *Pin.* 357. Raii *Syn.* 125.

F. botryites, sive florida major, pinnulis non dentatis, ex adverso nascentibus. Moris. v. 3. 593. *sect.* 14. t. 4. *f.* 1.

F. florida, sive *Osmunda regalis*. Ger. *Em.* 1131. *f.*

F. majoris alterum genus. Trag. *Hist.* 543. *f.*

F. latifolia. Cord. *Hist.* 134. *f.*

F. palustris. Dod. *Pempt.* 463. *f.*

F. aquatica, et *F. florescens*. Dalech. *Hist.* 1225. *f. f.*

In deep watery bogs, woods, and meadows, not very common.

Perennial. June, July.

Root tuberous, hard, scaly, beset with numerous fibres, and having in the centre a whitish core, which some persons, according to Gerarde, have named the heart of Osmund the Water-man. *Fron*ds several, erect, two or three feet high, doubly pinnate, smooth, bright green; the primary divisions from six to ten, nearly opposite, hardly a span long; *leaflets* more numerous, often decidedly alternate, sessile, or nearly so, oblong, bluntish, entire, or obscurely crenate, with one rib, and numerous transverse veins; the base dilated, heart-shaped, or somewhat lobed. Some of the upper leaflets are cut, and as it were partially transmuted into dense clusters, or spikes, of capsules, several of the upper divisions of the frond consisting entirely of such capsules, composing a compound panicle. Each capsule is light brown, veiny, supported by a short stalk. Nothing has been discovered of the stigma, barren flowers, or mode of impregnation. The seeds are numerous, nearly globular.

The name of *Osmunda* appears to have originated in England. *Osmund*, in Saxon, is the proper name of a man, said to mean domestic peace: so that *Osmunda* is nearly equivalent to *Lysi-*

machia, or Loosestrife. De Theis gives it as one of the appellations of Thor; but he was the god of war. I have presumed, from Gerard's account, that it might, like many other names of plants, commemorate some particular person, but this is mere conjecture.

Dr. Hooker justly celebrates the beauty of this Fern. Its reputed "strengthening and healing" virtues are very problematical.

475. BOTRYCHIUM. Moonwort.

Sw. Syn. Fil. 8. *Willd. Sp. Pl.* v. 5. 61. *Br. Prodr.* 164.

Nat. Ord. see n. 474.

Caps. distinct, sessile, on the upper side of a branched common stalk, naked, nearly globular, even, without any protuberance or ring, of 1 cell, and 2 equal, hemispherical valves, bursting transversely. *Cover* none. *Seeds* numerous, very minute.

Root branching. *Frond* solitary, smooth, consisting of a more or less compound *leaf*, or *leaves*, and a compound *spike* of *capsules*.

1. B. *Lunaria*. Common Moonwort.

Leaf solitary, pinnate; leaflets fan-shaped, notched.

B. *Lunaria*. *Sw. Syn. Fil.* 171. *Willd. Sp. Pl.* v. 5. 61. *Comp. ed.* 4. 171. *Hook. Lond. t.* 66. *Scot. p.* 2. 158.

Osmunda Lunaria. *Linn. Sp. Pl.* 1519. *Fl. Br.* 1107. *Engl. Bot.* v. 5. t. 318. *Bolt. Fil.* 4. t. 4. *Fl. Dan. t.* 18. f. 1. *Lam. t.* 865. f. 1. *Dicks. H. Sicc. fasc.* 5. 17. *Ehrh. Crypt.* 181.

O. n. 1686. *Hall. Hist.* v. 3. 6.

O. foliis lunatis. *Garid.* 345. t. 78.

Lunaria minor. *Raii Syn.* 128. *Ger. Em.* 405. f. *Matth. Vulgr.* v. 2. 254. f. *Camer. Epit.* 643. f. *Fuchs. Hist.* 482. f. *Ic.* 273. f. *Moris.* v. 3. 594. sect. 14. t. 5. f. 1. *Gesn. de Lunariis*, 55.

L. Botrytis. *Bauh. Hist.* v. 3. 710. f.

Epimedium Dioscoridis. *Column. Phytob.* 80. t. 81.

β. *Lunaria minor ramosa*. *Raii Syn.* 129.

L. botrytis minor, multifolia. *Bauh. Hist.* v. 3. 711. f.

L. rarior species. *Camer. Epit.* 644. f.

γ. L. racemosa minor, adianti folio. *Breyn. Cent. t.* 93. *Moris.* v. 3. 593. sect. 14. t. 5. f. 2.

δ. L. minor, foliis dissectis. *Raii Syn.* 129.

L. racemosa minor, matricariæ folio. *Breyn. Cent. t.* 94. *Moris.* v. 3. 594. sect. 14. t. 5. f. 3.

Botrychium rutaceum. *Sw. Syn. Fil.* 171. *Willd. Sp. Pl.* v. 5. 62.

In mountainous pastures or meadows.

Perennial. *June*.

Root of several, simple, cylindrical, clustered or whorled, fibres.

Herb very smooth, a little succulent, of a pale opaque green, erect, not a span high. *Common stalk* simple, cylindrical, pale, with a few large, brownish, sheathing scales at the bottom; a stalked, pinnate, upright *leaf* about the middle, consisting of five or six pair of fan-shaped, or crescent-like, stalked *leaflets*, with an odd one, all notched or cut; and a terminal, twice compound *spike* of small, round, brownish *capsules*, nearly sessile on one flat side of a linear common stalk, or receptacle.

β has a branched *stalk*, bearing several *leaves* and compound *spikes*, alternately disposed. γ is a very slight variety, with more jagged *leaflets* than ordinary. δ has pinnatifid *leaflets*, and a more spreading habit. All these varieties, and perhaps others, are found occasionally, intermixed here and there, with the plant in its proper or common form; but never, as far as I could learn, so numerously distinct, as to have the appearance of a different species.

An ointment made of this herb, rubbed on the loins about the region of the kidneys, is recorded by Ray, on the authority of Needham, as an infallible remedy for the dysentery; but Haller remarks, that if we believe this, or any other of its restraining properties, on the report of authors, we are not to give credit to its magical virtues. These have been attributed to this, and various other plants, in which some resemblance to the moon was imagined. Even Conrad Gesner condescended to give an account of such plants, and Thomas Bartholin republished his treatise, with a few wooden cuts, at Copenhagen, in 1669.

476. OPHIOGLOSSUM. Adder's-tongue.

Linn. Gen. 559. *Juss.* 14. *Fl. Br.* 1106. *Tourn. t.* 325. *Lam. t.* 864.

Hedw. Theor. 4. t. 4. f. 20—23. *Sw. Syn. Fil.* 8.

Nat. Ord. see n. 474.

Caps. imbedded, in 2 opposite rows, in the substance of a simple, linear, slightly compressed, *spike*, naked, roundish, of 2 equal, vertical, depressed valves, and 1 cell, bursting horizontally. *Cover* none. *Seeds* numerous, very minute, flattened, with a pellucid border.

Root like the last. *Frond* solitary, smooth, consisting of a simple, undivided, rarely palmate, entire *leaf*, and a stalked *spike*, occasionally multiplied, of numerous *capsules*.

1. *O. vulgatum*. Common Ovate Adder's-tongue.

Leaf ovate, veinless, about as tall as the spike.

O. vulgatum. Linn. *Sp. Pl.* 1518. Willd. *v.* 5. 58. *Fl. Br.* 1106. *Engl. Bot.* *v.* 2. *t.* 108. Hook. *Lond.* *t.* 78. *Scot.* *p.* 2. 158. *Bolt. Fil.* 2. *t.* 3. *Fl. Dan.* *t.* 147. Dicks. *H. Sicc. fasc.* 9. 18. Ehrh. *Crypt.* 171. Bauh. *Pin.* 354. Plum. *Fil. pref.* 36. *t. B. f.* 5. Moris. *v.* 3. 595. *sect.* 14. *t.* 5, at the bottom.

O. n. 1685. Hall. *Hist.* *v.* 3. 5.

Ophioglossum. Raii *Syn.* 128. *Trag. Hist.* 323. *f.* Fuchs. *Hist.* 577. *f.* Ic. 332. *f.* Matth. *Valgr.* *v.* 1. 543. *f.* Camer. *Epit.* 364. *f.* Ger. *Em.* 404. *f.*

In moist pastures.

Perennial. *May*.

Root rather deep in the ground, with horizontal clustered fibres.

Herb very smooth, about a span high, of a deeper green than the *Botrychium*. The stalk pale, tapering downward. *Leaf* invariably solitary, ovate, rather variable in breadth, nearly upright. *Spike* stalked, pointed, more or less elevated above the leaf, sometimes double, or lobed at the base, as Morison's figures show.

477. LYCOPODIUM. Club-moss.

Linn. *Gen.* 561. Juss. 12. *Fl. Br.* 1108. Lam. *t.* 872. Dill. *Musc.* 441.

Selaginoides. Dill. *Musc.* 460.

Lycopodioides. Dill. *Musc.* 462.

Selago. Dill. *Musc.* 435.

Nat. Ord. *Mnscei*. Linn. 56. Juss. 4, *spurii*. *Lycopodiaceæ*. Sw. *Syn. Fil.* 173. Br. *Prodr.* 164.

Caps. axillary, solitary, sessile, roundish, slightly compressed, of 2 equal valves, and 1 cell, bursting vertically. *Seeds* numerous, chaffy, very minute.

Some species produce, besides these proper *capsules*, others with 2 or 3 tumid valves, containing several, Mr. Brown says from 1 to 6, globose bodies, whose real nature has not been ascertained, and which may possibly be *gemmæ*, like those of viviparous flowers. Mr. Joseph Fox, late of Norwich, and Mr. Lindsay of Jamaica, have proved the chaffy *seeds* above mentioned to be really *seeds*, and have raised abundance of plants from them. See *Tr. of Linn. Soc.* *v.* 2. 313—315. This fact seems to have escaped Dr. Wahlenberg, who has several excellent remarks on the subject, in his *Fl. Lapp.* 290—293. Linnæus took the *capsules* for *anthers*.

The habit of this genus is peculiar, more resembling Mosses than Ferns. *Stem* mostly branched, either upright or

trailing, densely leafy. *Leaves* small and narrow, in several rows, sessile, simple, undivided, either entire or serrated, of a dry and rigid substance, evergreen; those which are accompanied by *capsules* diminished, in some species, to the scales of a *spike*, with elongated points. *Caps.* pale yellow, small, naked. *Seeds* often highly inflammable, like powdered sulphur.

1. *L. clavatum*. Common Club-moss.

Stem creeping. Branches ascending; partially almost naked. Leaves scattered, incurved, with filamentous points. Spikes, two or three, cylindrical, stalked, with dilated, membranous scales.

L. clavatum. *Linn. Sp. Pl.* 1564. *Willd. v. 5.* 16. *Fl. Br.* 1108. *Engl. Bot. v. 4. t.* 224. *Hook. Scot. p. 2.* 159. *Fl. Dan. t.* 126. *Dicks. H. Sicc. fasc. 7.* 18. *Ehrh. Crypt.* 112.

L. n. 1722. *Hall. Hist. v. 3.* 22.

Lycopodium. *Raii Syn.* 107.

L. vulgare pilosum amfragosum et repens. *Dill. Musc.* 441. *t.* 58. *f.* 1.

Muscus terrestris. *Trag. Hist.* 555. *f.* *Matth. Valgr. v. 1.* 57. *f.* *Camer. Epit.* 32. *f.* *Dalech. Hist.* 1324. *f.*

M. terrestris repens, pediculis foliaceis binis clavis in altum se erigentibus. *Pluk. Almag.* 258. *Phyt. t.* 47. *f.* 8. *Moris. v. 3.* 623. *sect. 15. t. 5. f.* 2.

M. terrestris repens, a *Trago pictus*. *Bauh. Hist. v. 3.* 758. *f.*

M. clavatus, sive *Lycopodium*. *Ger. Em.* 1562. *f.* *Moris. v. 3.* 623. *n.* 1.

M. clavatus. *Lob. Ic. v. 2.* 244. *f.*

Chamæpeuce. *Cord. Hist.* 111. 2. *f.*

Pes ursinus. *Gesn. de Lunariis.* 64.

On mountainous heaths, or stony moors, abundantly.

Perennial. *July, August.*

Roots of several strong scattered fibres. *Stems* procumbent, trailing, branching, leafy, several feet in length. *Leaves* crowded, curved upwards, linear-lanceolate, flat, ribless, smooth, deep green, partly serrated, tipped with a capillary point; those of the branches erect; the upper ones loosely dispersed. *Spikes* terminal, usually in pairs, rarely one, or three, densely beset with shortened, dilated, ovate, entire, long-pointed *leaves*, or *scales*, in whose bosoms the small, sulphur-coloured *capsules* are situated. I never heard of more than the usual kind, whose minute, copious, volatile *seeds* are used in Germany for artificial lightning on the stage, and are sold in the shops. When dispersed in the air, they take fire with a candle, and suddenly explode.

2. *L. Selaginoides*. Prickly Club-moss.

Stems recumbent, branched; shorter than the solitary, ascending, tumid spikes. Leaves scattered, lanceolate, fringed; the floral ones larger and more spreading.

L. Selaginoides. *Linn. Sp. Pl.* 1565. *Willd.* v. 5. 28. *Fl. Br.* 1109. *Engl. Bot.* v. 16. t. 1148. *Hook. Scot.* p. 2. 159. *Fl. Dan.* t. 70. *Dicks. Dr. Pl.* 90. *H. Sicc. fasc.* 7. 19.

L. n. 1717. *Hall. Hist.* v. 3. 20. t. 46. f. 1.

Selaginoides foliis spinosis. *Raii Syn.* 106. *Dill. Musc.* 460. t. 68.

Muscus terrestris erectus minor polyspermos. *Raii Syn. ed.* 2. 27. *Moris.* v. 3. 624. n. 10. sect. 15. t. 5. f. 11, not 10.

M. terrestris repens, clavis singularibus foliosis erectis. *Scheuchz. It. Alp.* I. v. 1. 43. t. 6. f. 1.

In watery heathy mountainous situations.

On the loftiest mountains of Westmoreland, Wales, and the Highlands of Scotland.

Perennial. *August*.

Roots fibrous, small. *Stems* several, short, branched, recumbent, leafy; a few of them ascending, elongated, and each terminating in a comparatively large, erect, dense, leafy, acute, yellowish, solitary spike, about an inch in length. *Leaves* imbricated, lanceolate, acute, ribless, fringed, or rather toothed; those of the branches bright green; of the spike larger, yellower, spreading, and more deeply serrated. *Caps.* axillary, solitary; those in the upper part of each spike bivalve, full of chaffy seeds, such as are proper to the genus; those of the lower half rounder, more tumid, each containing four white globular bodies, one placed upon the other three. To the nature of these bodies I have, with much diffidence, adverted under the generic character.

3. *L. inundatum*. Marsh Club-moss.

Stems depressed, creeping, slightly branched. Leaves scattered, linear-lanceolate, pointless, entire. Spikes solitary; their scales dilated at the base.

L. inundatum. *Linn. Sp. Pl.* 1565. *Willd.* v. 5. 25. *Fl. Br.* 1110. *Engl. Bot.* v. 4. t. 239. *Hook. Scot.* p. 2. 159. *Fl. Dan.* t. 336. *Dicks. H. Sicc. fasc.* 4. 18. *Ehrh. Crypt.* 122.

L. n. 1721. *Hall. Hist.* v. 3. 22.

L. palustre repens, clava singulari. *Vaill. Par.* 123. t. 16. f. 11. *Dill. Musc.* 452. t. 62. f. 7.

Muscus terrestris repens, clavis singularibus foliosis erectis. *Raii Syn.* 108.

In the wet part of turfy bogs, or sandy heaths.

On Hampstead and Bagshot heaths, also near Chiselhurst, and

on mountains in the North. *Ray*. About Tonbridge. *Mr. Forster*. Warwickshire. *Mr. Purton*. On St. Faith's heath near Norwich. *Mr. Rose*. In Scotland, but not common. *Lightfoot*.

Perennial. *June, July*.

The stems creep very close to the ground, with many short scattered *radicles*, and are three or four inches long, slightly branched, densely leafy. *Leaves* of a pale dull green, ascending, almost linear, entire, acute, but not pointed or bearded. *Spikes* solitary, on simple, upright, leafy branches, each *spike* an inch, or inch and half, long, erect, rather pale, their *scales* dilated at the base, often with a tooth at each side near the middle. *Caps.* in the bosoms of the scales, solitary, pale, uniform, full of minute chaffy *seeds*.

4. *L. Selago*. Fir Club-moss.

Stems upright, forked, level-topped. *Leaves* in eight rows, uniform, lanceolate, pointless, entire, slightly spreading.

L. Selago. *Linu. Sp. Pl.* 1565. *Willd. v. 5.* 49. *Fl. Br.* 1111. *Engl. Bot. v. 4. t. 233.* *Hook. Scot. p. 2.* 159. *Fl. Dan. t. 104.* *Ehrh. Crypt. 1.*

L. n. 1716. *Hall. Hist. v. 3.* 19.

Selago foliis et facie Abietis. *Raii Syn.* 106.

S. vulgaris, Abietis rubræ facie. *Dill. Musc.* 435. *t. 56. f. 1.*

Muscus terrestris abietiformis. *Raii Syn. ed. 2.* 27. *Moris. v. 3.* 624. *sect. 15. t. 5. f. 9.*

M. terrestris species altera. *Scheuchz. It. Alp. I. v. 1.* 44. *t. 6. f. 2.*

On moist mountainous heaths, especially in alpine situations, though sometimes on sandy lowland bogs.

On the high mountains of Wales, Yorkshire, Derbyshire &c. *Ray*. In Sussex. *Dillenius*. On Felthorpe bogs, Norfolk. *Mr. Joseph Fox*. Frequent in the Highlands of Scotland. *Hooker*.

Perennial. *June—August*.

Root fibrous. *Stems* a span high, composing dense tufts, level at the top, each once or twice forked, cylindrical, densely leafy all over. *Leaves* uniform, crowded, in eight rows, of a bright shining green, permanent, lanceolate, entire, acute, pointless, moderately spreading every way. *Caps.* on the uppermost shoots, axillary, kidney-shaped, uniform, with plenty of minute *seeds*, from which *Mr. J. Fox* of Norwich, by allowing them to scatter themselves on wet sandy bog-earth, raised living plants, before the year 1779, as recorded in *Tr. of Linn. Soc. v. 2.* 315. *Buds* are sometimes produced in the place of *capsules*; see *Engl. Bot.*

Lightfoot records that the highlanders use this plant, instead of alum, to fix colours in dyeing; and that they sometimes take an infusion of it, as an emetic and cathartic, though it operates violently, and, unless in a small dose, brings on giddiness and

convulsions. No wonder that a decoction kills the lice of swine and oxen, as Linnæus asserts in his *Fl. Suec.*

5. *L. annotinum*. Interrupted Club-moss.

Stems recumbent at the base; branches erect, annually profliferous at the summit. Leaves scattered, in five rows, lanceolate, acute, naked-pointed, slightly serrated; the floral ones broader than they are long, imbricated.

L. annotinum. Linn. *Sp. Pl.* 1566. Willd. *v.* 5. 23. *Fl. Br.* 1111. *Engl. Bot.* *v.* 24. *t.* 1727. Hook. *Scot.* *p.* 2. 159. *Fl. Dan.* *t.* 127. *Ehrh. Crypt.* 62.

L. n. 1720. Hall. *Hist.* *v.* 3. 21.

L. elatius juniperinum, *clavis singularibus*, *sine pediculis*. Dill. *Musc.* 455. *t.* 63. *f.* 9. Giss. *app.* 87. *t.* 2. Raii *Syn.* 107. Moris. *v.* 3. 624. *sect.* 15. *t.* 5. *f.* 3.

Muscus terrestris repens, *clavis singularibus foliosis erectis*. Pluk. *Almag.* 258, (not 248,) *Phyt. t.* 205. *f.* 5.

On the mountains of Wales and Scotland.

In Carnarvonshire, especially on mount Glyder. Mr. Lhwyd. On the sides of the Highland mountains, but not common. Light-foot. Upon the summit of Cairn Gorm. Hooker. Frequent in the Highlands of Scotland. Mr. G. Don.

Perennial. June—August.

A large and handsome species, often a foot high, though the lower part of the stem is recumbent and creeping, throwing out several branched radicles. The flowering branches are erect, densely leafy, but little subdivided, each terminating in a solitary upright spike, whose scales being deciduous, seem to leave the branch partly naked; but it afterwards bears proper leaves, except a few diminished ones, just under where the spike had been, and produces, in the following season, another spike. Hence the jointed, or interrupted, aspect of the branches. The leaves are crowded, spreading in five rows, lanceolate, nearly flat, somewhat serrated, with a sharp naked point, but not awned, nor bearded. Spikes rather tawny, an inch, or when at maturity an inch and half, long; their scales shortened, and much dilated in width, assuming an ovate, or sometimes a kidney-like, shape, though always pointed. Caps. kidney-shaped, but smaller. We have this species from North America, and Mr. Menzies brought it also from Banks's isles, on the north-west coast of that continent.

6. *L. alpinum*. Savin-leaved Club-moss.

Stems prostrate. Branches erect, clustered, forked, level-topped. Leaves acute, keeled, imbricated in four rows. Scales of the spikes ovate-lanceolate, flat.

L. alpinum. Linn. *Sp. Pl.* 1567. *Fl. Lapp. ed.* 2. 338. *t.* 11. *f.* 6.
Willd. *v.* 5. 20. *Fl. Br.* 1112. *Engl. Bot. v.* 4. *t.* 234. Hook.
Scot. *p.* 2. 159. *Fl. Dan. t.* 79. Dicks. *Dr. Pl.* 46. Ehrh.
Crypt. 11.

L. n. 1719. Hall. *Hist. v.* 3. 21.

L. Sabinæ facie. Raii *Syn.* 108. Dill. *Musc.* 445. *t.* 58. *f.* 2.

On the highest mountains of Scotland, Wales, and the north of England, in stony and rather moist situations, plentifully.

Perennial. *August.*

Stems round, strong, smooth, somewhat leafy, prostrate, creeping, by means of scattered fibrous radicles, to a considerable extent, and bearing many tufts of upright, forked, densely leafy, level-topped, partly flowering, *branches*, from two to four inches high. *Leaves* of a deep glaucous green, rather loosely imbricated in four rows, small, acute, keeled, uniform, entire, pointless. *Spikes* numerous, solitary, erect, cylindrical, from half an inch to an inch long, of a pale yellowish green. *Scales* ovate, pointed, not quite entire, flat, membranous. *Caps.* nearly orbicular, yellowish, uniform.

A very handsome evergreen, with much of the aspect of a Juniper or Savin. It is bitter, with something of an aromatic flavour, and an emetic quality; but though so abundant in Scotland and the Hebrides, Lightfoot does not mention its being applied to any use.

Dillenius, though he well knew this species, and has correctly delineated the exotic *L. complanatum*, certainly misapplied synonyms of Tragus, Gerarde, Dalechamp and the two Bauhins, to *L. alpinum*, which belong to the *complanatum*. The taller, less leafy, flowering branches, well represented in the old wooden figures of the above authors, are decidedly characteristic of *L. complanatum*, to say nothing of the compressed foliage.

478. EQUISETUM. Horsetail.

Linn. *Gen.* 559. Juss. 17. *Fl. Br.* 1102. Tourn. *t.* 307. Lam. *t.* 862.
Hedw. *Theor.* 33. *t.* 1, 2.

Nat. Ord. *Coniferæ*? Linn. 51. *Filices dubiæ.* Juss. 5.
Quite undetermined, though this genus is certainly akin to *Filices*, and even to *Palmæ*, or at least *Cycadeæ*. See *Br. Prodr.* 346.

Catkin ovate-oblong, tessellated, close, of many peltate, stalked *scales*, on a simple *common stalk*, each *scale* angular in front, bearing at the back from 4 to 7 oblong membranous *cells*, parallel to each other, and to the *partial stalk* of the scale, which they surround, each finally bursting lengthwise into 2 equal valves. *Cone* rather

elongated, the *scales* separating from each other, disclosing the *cells*, which discharge abundance of very minute globular *seeds*. Every *seed*, or *germen*, is encompassed with 4 spiral *filaments*, attached to its base, and terminating in 4 dilated flat appendages, taken by Hedwig for *anthers*, and producing a fine powder, or *pollen*.

Roots perennial, creeping. *Stems* herbaceous, more or less branched, furrowed, tubular, jointed, with a cylindrical, sharp-toothed, membranous *sheath*, arising from each joint, and embracing a portion of the stem or branch above it. *Leaves* none. *Catkins* terminal, stalked, solitary, erect, naked, brown or blackish. Some species bear them singly, on simple, radical, many-sheathed shoots, soon withering away, before the copiously-branched sterile *fronds* appear. In others they terminate the proper *frond*. Several, like Grasses, secrete a quantity of flinty earth, mostly lodged in their cuticle. They are natives of marshy or watery situations, chiefly in cold or temperate climates. Many of the older synonyms are very obscure.

1. *E. sylvaticum*. Branched Wood Horsetail.

Branches compound, curved downwards, smooth.

E. sylvaticum. Linn. *Sp. Pl.* 1516. Willd. *v.* 5. 3. Fl. Br. 1102. Engl. Bot. *v.* 27. t. 1874. Hafod Tour, 15. Hook. Scot. *p.* 2. 161. Bolt. Fil. 30. t. 32, 33. Fl. Dan. t. 1182. Ehrh. Crypt. 161. Raii Syn. 130.

E. n. 1680. Hall. Hist. *v.* 3. 3.

E. sylvaticum, tenuissimis setis. Bauh. Theatr. 245. f.

E. sive Hippuris tenuissima non aspera. Bauh. Hist. *v.* 3. *p.* 2. 723, 2. f. 724.

β. *E. sylvaticum procumbens*, setis uno versu dispositis. Dill. in Raii Syn. 131.

In shady moist woods, by trickling rills, but not very frequent.

Found chiefly in mountainous situations. By a wet dripping rock, beyond Tylogè bridge, to the left, at Hafod, Cardiganshire.

Perennial. April, May.

A very elegant species, twelve or eighteen inches high. *Stems* erect, beset with many whorls of slender, compound, angular, smooth (not rough) spreading *branches*, drooping at the ends; each whorl having a pale-brown torn *sheath* above it. *Catkin* solitary, terminal, erect, ovate, on a naked *stalk*.

The variety β is a very trivial one, accidentally procumbent, whence the *branches* are all turned upwards from the ground, and become unilateral.

2. *E. fluviatile*. Great Water Horsetail.

Sterile stems beset with innumerable, roughish, doubly angular, branches; flowering ones unbranched, with numerous, crowded, deeply toothed sheaths.

E. fluviatile. Linn. *Sp. Pl.* 1517. Willd. v. 5. 2. *Fl. Br.* 1104. *Engl. Bot.* v. 29. t. 2022. Hook. *Scot. p.* 2. 161. *Bolt. Fil.* 66. t. 36, 37.

E. n. 1675. Hall. *Hist.* v. 3. 1.

E. Telmateia. Ehrh. *Beitr.* v. 2. 159. *Crypt.* 31. *Fl. Dan.* t. 1469.

E. eburneum. Roth *Catal.* v. 1. 129.

E. majus. Raii *Syn.* 130. Ger. *Em.* 1113. f.

E. primum. Matth. *Valgr.* v. 2. 373. f. Dalech. *Hist.* 1069. f.

E. palustre longioribus setis. Bauh. *Theatr.* 241. f.

Hippuris. Lob. *Ic.* 793. f.

H. major. Dod. *Pempt.* 73. f.

In watery places, about the banks of rivers and lakes.

Perennial. April.

This is by far our largest species, differing from the foregoing in bearing the fructification on a separate *stem* from the branched or whorled *frond*; as is likewise the case with the following one, *E. arvense*. All the others, hitherto observed in Britain, have terminal *catkins*, at the tops of the *fronds*. The sterile *stems* of *E. fluviatile* are quite erect, at least a yard high, often much more, furnished from top to bottom with whorls of numerous, long, slender, minutely rough, distantly jointed, not often divided, branches, whose four angles have each a longitudinal furrow, first noticed by Mr. J. D. Sowerby, constituting a clear distinction between the present species and the next. Each joint is crowned by a small *sheath*, having four or five long pale teeth. The large cylindrical *catkins* stand upon much shorter unbranched *stems*, appearing before the others, invested with nine or ten pale, tubular, ribbed *sheaths*, nearly close together, each of which terminates in a fringe of long, upright, brown teeth, amounting, as Haller observes, to forty. In the next species they are scarcely half so many, and the *sheaths* are but about three or four, rarely five, on each stem.

3. *E. arvense*. Corn Horsetail.

Sterile stems beset with roughish, mostly simple, angular branches; flowering ones unbranched; their sheaths distant, deeply toothed.

E. arvense. Linn. *Sp. Pl.* 1516. Willd. v. 5. 1. *Fl. Br.* 1103. *Engl. Bot.* v. 29. t. 2020. Hook. *Scot. p.* 2. 160. *Curt. Lond. fasc.* 4. t. 64. *Bolt. Fil.* 62. t. 34. Ehrh. *Crypt.* 21.

E. n. 1676. Hall. *Hist.* v. 3. 2.

E. arvense, longioribus setis. Raii *Syn.* 130. Bauh. *Theatr.* 247. f.

E. segetale. Ger. Em. 1114. f.

E. secundum. Matth. Valgr. v. 2. 374. Camer. Epit. 771. f.

E. alterum. Lob. Ic. 794. f.

E. alterum, sive minus, Matthioli. Dalech. Hist. 1070. f. 1, 2.

E. minus terrestre. Bauh. Hist. v. 3. p. 2. 723, 2. f, f.

E. longius. Fuchs. Hist. 322. f.

Hippuris minor. Dod. Pempt. 73. f, f. Trag. Hist. 694. f. Lob. Ic. 794. f.

β. *Equisetum pratense, longissimis setis.* Dill. in Raii Syn. 130. Bauh. Theatr. 246. f.

E. minus. Fuchs. Hist. 323. f.

In moist cornfields, or meadows, frequent.

Perennial. March, April.

Root much branched, creeping extensively, producing in the spring several simple, upright, flowering *stems*, quite destitute of branches, a span high, cylindrical, smooth, juicy, of a pale brown, bearing three or four, rather distant, membranous, cylindrical, brown-ribbed *sheaths*, with about twenty deep, sharp, darker, upright teeth, or segments; and at the top a solitary, ovate-oblong, brown *catkin*, whose *scales*, when ripe, separate, and show the white *cells*, as in other species. After the flowering shoots are withered the green sterile *fronds* appear, twice or thrice as long as the former, either upright or decumbent, beset from top to bottom with many whorls of slender, jointed, spreading, roughish, green *branches*, mostly simple, with simple angles; the lower ones sometimes elongated or branched; their joints surmounted by small pale *sheaths*. These *fronds* are reckoned unwholesome to such animals as feed upon them in autumn, especially swine.

The flowering *stems* were mistaken by Mr. Lawson for our *E. variegatum*, n. 7, under whose synonym they are mentioned in Raii Syn. 130. n. 3, not without a proper warning from Dillenius.

4. *E. palustre.* Marsh Horsetail.

Stem deeply furrowed, branched throughout, with a terminal catkin; branches simple, erect, roughish, with simple angles.

E. palustre. Linn. Sp. Pl. 1516. Willd. v. 5. 5. Fl. Br. 1103. Engl. Bot. v. 29. t. 2021. Hook. Scot. p. 2. 161. Bolt. Fil. 64. t. 35. Fl. Dan. t. 1183. Raii Syn. 131. Lob. Ic. 795. f. Ger. Em. 1114. f. Ehrh. Crypt. 61.

E. n. 1677. Hall. Hist. v. 3. 2; excluding most of the varieties.

β. *E. palustre, tenuissimis et longissimis setis.* Bauh. Prodr. 24? Raii Syn. 131?

E. palustre minus polystachion. Bauh. Prodr. 24. Dill. in Raii Syn. 131. t. 5. f. 3.

In spongy watery bogs not uncommon.

Perennial. *June, July.*

Stem rather slender, deeply furrowed, beset throughout with whorls of slender, ascending, deeply furrowed, angular, minutely rough *branches*, whose joints are each crowned with a small deeply-toothed *sheath*, often paler than in the foregoing. The terminal *catkin*, always solitary, at the top of the *frond*, most essentially distinguishes this species from *E. arvense*, agreeing so far with the following, but is more slender and cylindrical than either.

The variety β I have not examined; the γ is similar to what occurs in *E. limosum*, confounded with the present by Haller.

5. *E. limosum*. Smooth Naked Horsetail.

Stem partially naked, striated, smooth as well as the *branches*. *Catkin* terminal, elliptical.

E. limosum. Linn. *Sp. Pl.* 1517. Willd. v. 5. 4. *Fl. Br.* 1105. *Engl. Bot.* v. 13. t. 929. Hook. *Scot.* p. 2. 161. Bolt. *Fil.* 68. t. 38.

E. fluviatile. *Fl. Dan.* t. 1184. Ehrh. *Crypt.* 41. *Pl. Off.* 290.

E. n. 1677 β . Hall. *Hist.* v. 3. 2.

E. nudum lævius nostras. Raii *Syn.* 131. t. 5. f. 2, a, b.

In marshy watery places frequent.

Perennial. *June, July.*

Stems stouter than the last, about two feet high, very smooth to the touch, though finely striated, not deeply furrowed; either quite simple, or more usually furnished, in the upper part, with several simple, ascending, shortish *branches*, striated and smooth like the stem. *Sheaths* rather short, with many short brown teeth. *Catkin* large, elliptical, bluntish.

One Swiss specimen, from Mr. Davall, has a small *catkin* at the summit of each branch of the three uppermost whorls, resembling the variety of *E. palustre*, represented by Dillenius in Ray's *Synopsis*, t. 5. f. 3; but the *stem* is not deeply furrowed, as in that figure, which by this character is identified with *E. palustre*. I have seen no such variety of *E. limosum* in England.

6. *E. hyemale*. Greater Rough Horsetail. Shave-grass.

Stem naked, very rough, mostly branching at the base. *Sheaths* whitish; black at the top and bottom; teeth deciduous. *Catkin* terminal.

E. hyemale. Linn. *Sp. Pl.* 1517. Willd. v. 5. 8. *Fl. Br.* 1105. *Engl. Bot.* v. 13. t. 915. Hook. *Scot.* p. 2. 161. *Lond.* t. 161. *Lightf.* 650. Ehrh. *Crypt.* 51.

E. n. 1679. Hall. *Hist.* v. 3, 3.

E. nudum. *Raii Syn.* 131, *Ger. Em.* 1113. *f.*

E. junceum. *Dalech. Hist.* 1071. *f.*

E. foliis nudum, non ramosum. *Bauh. Pin.* 16.

Equisetum. *Camer. Epit.* 70. *f. A.*

Hippuris. *Trag. Hist.* 692. *f.*

β . *Equisetum foliis nudum, ramosum.* *Bauh. Pin.* 16. *Raii Syn.* 132.

E. tertium. *Matth. Valgr. v. 2.* 375. *f?* *Camer. Epit.* 772. *f?*

In boggy woods, but not very common.

In Lancashire, Warwickshire, and Wiltshire. *Ray, Merret.* In several parts of Yorkshire, Norfolk, and other counties, as well as in Scotland.

Perennial. *July, August.*

Root black, variously branched. *Stems* erect, of a deep glaucous green, from one to two feet high, cylindrical, uniformly and rather copiously furrowed, the furrows minutely toothed, and of a stony hardness. *Sheaths* tight, rather short, whitish, with a circle of black at the top and bottom, and crowned at first with a row of black, lanceolate, pointed teeth, which very soon fall off, as Willdenow has remarked. *Catkin* terminal, solitary, at first ovate, pointed, and black; subsequently elliptical, abounding with whitish powdery *seeds*.

The *stems* are generally quite simple, or branched towards the bottom only; nor have I ever seen them so much divided as in Gerarde's figure, still less like the cuts indicated, on Bauhin's authority, under the variety β , to which therefore marks of doubt are subjoined.

That eminent chemist Sir Humphry Davy first detected a quantity of pure *silex*, or flinty earth, in the furrowed cuticle of this plant, which accounts for its power, as a file, in polishing wood, ivory, or even brass. This purpose it has long served in England, under the name of Dutch Rushes, being usually imported from Holland. So Wheat Straw, whose cuticle contains the same earth in an impalpable state, like others of the natural family of Grasses, see *v. 1.* 71, is used, when burnt, to give the last polish to marble. See *Introd. to Botany, ed. 6.* 62.

7. *E. variegatum.* Variegated Rough Horsetail.

Stem naked, very rough, branched at the base. *Sheaths* black, with white, membranous, lanceolate teeth. *Catkin* terminal.

E. variegatum. *Schleich. Catal.* 21. *Willd. Sp. Pl. v. 5.* 7. *Comp. ed. 4.* 170. *Engl. Bot. v. 28. t.* 1987. *Hook. Scot. p. 2.* 161.

E. n. 1678. *Hall. Hist. v. 3.* 3.

E. nudum minus variegatum Basiliense. *Bauh. Pin.* 16. *Prodr.* 24. *Theatr.* 250. *no f.*

In wet sandy ground in Scotland and Ireland.

On the sands of Barry, by the sea coast of Angus. *Mr. G. Don.* At

Baldogle, near Dublin; by whom found I have no account.

Perennial. *July—November.*

Whole plant smaller, and much more slender, than the last. The crown of the branching creeping *root* sends up several slender *stems*, seldom a foot high, often much less, either erect or ascending, furrowed and rough like *E. hyemale*, so that, except its smaller size, this species is equally fit for use as a file. The *sheaths* which crown the joints are rather more lax, especially the uppermost of all, and their upper half only is black, crowned with far more permanent and conspicuous white, lanceolate teeth, the lower portion of each *sheath* being pale, or glaucous. *Catkin* ovate, acute, blacker than in *E. hyemale*, with a more slender stalk.

The fibres of the *root* of this curious little species are remarkably woolly, like those of Grasses that grow in loose sand.

479. PILULARIA. . Pillwort.

Linn. Gen. 561. *Juss.* 16. *Fl. Br.* 1143. *Vaill. Par.* 159. *Lam. t.* 862. *Spreng. Crypt. f.* 40.

Nat. Ord. *Filices.* *Linn.* 55. *Juss.* 5. *Marsileaceæ.* *Br. Prodr.* 166.

Common receptacles radical, dispersed, globular, of 4, or more, vertical cells, coriaceous, not bursting; the partitions membranous, irregular. *Anth.* almost globular, numerous, naked, simple, assembled in the upper half of each cell, in nearly sessile groups. *Germ.* likewise numerous, occupying the lower half of the same cell, globular, with a conical *stigma*. *Seeds* enlarged after impregnation, numerous, roundish-oblong with a constriction, filling the whole cavity of the cell, each wrapped in a close tunic of mucilage.

As the bodies which occupy the upper part of the cells waste away, those in the lower part gradually swell, having the appearance of *seeds*, though Dr. Hooker, with all his well-known acuteness of inquiry, could discover no traces of organization. I know of no experiments to prove their germination, but this may safely be presumed from analogy, as the affinity of this genus to Ferns and their allies, is presumed, from the involute form of its shoots. If the *embryo* of *Cycas* bears so very small a proportion to its large *vitellus*, or rather *albu-*

men, the structure of that organ, in so minute a *seed* as this before us, may well be inscrutable. Only one species of *Pilularia* is known.

1. *P. globulifera*. Creeping Pillwort. Pepper-grass.

- P. globulifera*. Linn. *Sp. Pl.* 1563. Willd. v. 5. 535. *Fl. Br.* 1143. *Engl. Bot.* v. 8. t. 521. Hook. *Scot.* p. 2. 160. *Lond.* t. 83. Bolt. *Fil.* 72. t. 40. *Fl. Dan.* t. 223. Bull. *Fr.* t. 375. Ehrh. *Phyt.* 29. *P. palustris juncifolia*. Vaill. *Par.* 159. t. 15. f. 6. Dill. *Musc.* 538. t. 79.

Graminifolia palustris repens, vasculis granorum piperis æmulis. Raii *Syn.* 136. Moris. *Hist.* v. 3. 606. sect. 15. t. 7. f. 49.

Muscus aureus capillaris palustris, inter foliola folliculis rotundis (ex sententia D. Doody) quadripartitis. Pluk. *Almag.* 256. *Phyt.* t. 48. f. 1.

Pepper Grass. Petiv. *H. Brit.* t. 9. f. 8.

About the borders of lakes, or on gravelly heaths that are partially overflowed.

Near Streatham Wells. Plukenet. On Hounslow Heath, towards Hampton. Doody. At Hainford, and St Faith's Newton, to the North of Norwich. Mr. Crowe and Mr. Pitchford. Near Yarmouth. Mr. D. Turner. About two miles from Mold, on the north side of the Chester road; Mr. Griffith. With. On Hillingdon Common, Middlesex, I have often gathered this plant. Dr. Hooker mentions several places in Scotland where it has been observed.

Perennial. June, July.

Stems thread-shaped, partly branched, creeping close to the ground, and sending down tufts of small, slender, smooth, simple *radicles*, so as to cover a space of many inches diameter; and bearing larger tufts, of four or five awl-shaped, narrow, smooth, upright *leaves*, an inch or two long, opposite to each parcel of *radicles*, above. *Common receptacles* close to the leaves, solitary, slightly stalked, globular, blackish, resembling pepper-corns, but downy. These were observed by Doody to be "divided into four parts," but this seems to refer to their internal division, or cells, only, which are usually four, sometimes more. The outer *coat* does not split asunder, except, perhaps, when advancing towards decay, when the ripe *seeds* fill the internal cavities, and are whitish, roundish-oblong, with a contraction in the middle, and a terminal point, the whole coated with a glutinous transparent substance. The insertion of the *seeds*, by their fleshy stalks, into the inside of the hollow *receptacle*, resembles a Fig; but this, though a singular point of agreement, is the only one between these otherwise dissimilar genera, nor does it indicate any natural affinity.

480. ISOETES. Quill-wort.

Linn. Gen. 561. *It. Scan.* 420. *f.* 419. *Juss.* 17. *Fl. Br.* 1144.

Lam. t. 862. *Spreng. Crypt. f.* 41.

Calamaria. Dill. Musc. 540. *t.* 80.

Nat. Ord. Filices. Linn. 55. *Juss.* 5. *Marsileaceæ. Br. Prodr.* 166.

Barr. Fl. at the inside of the base of the inner *fronds*. *Common receptacle* membranous, sessile, ovate, somewhat compressed, of 1 cell. *Anthers?* or *Pollen?* of numerous oval grains, each, according to Dr. Hooker, pellucid in the centre.

Fert. Fl. similarly situated, at the bases of the outer *fronds*. *Common recept.* as in the *barr. fl.*, not bursting, of 1 cell, with several transverse bristle-shaped bars. *Seeds* very numerous, combined 3 together, in little stalked globules, externally rough; each angular at the inner side, convex at the outer.

By analogy only do we thus venture to name the parts of *fructification*; nor has the germination of this curious genus, still less its impregnation, ever been verified. The very few species known are aquatics, growing, and perfecting seed, entirely under water, at the bottoms of lakes or ponds, in Europe or in the East Indies. The *roots* are perennial, tuberous, with many long, stout, hairy *fibres*. *Fronds* radical, tufted, simple, awl-shaped, nearly upright, monoecious, bearing the fructification at their base, close to the *root*. Mr. Sowerby thought he found two *cells* in the common *receptacles*, as delineated in *Engl. Bot.* Dr. Hooker observed but one, though his figure, which is excellent, shows what may account for the mistake, and it is not impossible that the partition of the *fruit*, to which perhaps the *seeds* are originally attached, may subsequently be obliterated. The whole matter merits further inquiry, the impregnation of submersed plants in general, especially with separated flowers, being very little understood.

1. *I. lacustris*. Europæan Quillwort. Merlin's Grass. Fronds bluntly quadrangular, with four longitudinal cells.

I. lacustris. Linn. Sp. Pl. 1563. *Willd. v.* 5. 534. *Fl. Br.* 1144.

Engl. Bot. v. 16. *t.* 1084. *Hook. Scot. p.* 2. 160. *Lond. t.* 131.

Bolt. Fil. 74. *t.* 41. *Fl. Dan. t.* 191.

Calamaria folio brevior et crassior. Dill. Musc. 540. *t.* 80. *f.* 1.

Subularia vulgaris erecta, folio rigidissimo. Raii Syn. 306.

S. lacustris, seu Calamistrum, herba aquatico-alpina. Raii Syn. ed. 1. 210. t. 2.

β . *Calamaria folio longiore et graciliore. Dill. Musc. 541. t. 80. f. 2.*

Subularia fragilis, folio longiore et tenuiore. Dill. in Raii Syn. 307.

In the more shallow parts of the bottoms of clear alpine lakes.

In most of the lakes of North Wales, Scotland, Cumberland, and Westmoreland, composing a sort of green inundated turf. *Mr. Lhwyd* appears to have first remarked it in Britain.

Perennial. *May, June.*

The long, simple, somewhat hairy, fibres run perpendicularly down from the tuberous *root* into the ground. Each plant, having no *stem*, consists of a tuft of numerous awl-shaped *fronds*, more or less upright, acute, smooth, obtusely quadrangular, all varying in height, in different individuals, from three to nine inches. Internally they are formed of four longitudinal cells, having numerous transverse partitions. At the base each frond is dilated, with a membranous edge bordering the solitary, oval, flattened *common receptacles* above described. Of these that which ripens its contents the latest is judged to be the *seed-vessel*. The *seeds* are pure white, granulated all over, as in the East Indian species, whose *common receptacle* is certainly of but one cell, which, after the *seeds* fall out, is lined with their permanent stalks.

The taller, more slender, and brittle variety β , observed by Dr. Richardson, may perhaps be caused by those sudden risings of the waters, so frequent in mountainous countries, which will account for all the peculiar characters of this variety. Fish are said to feed, and grow fat, on the *Isoetes*.

SEVERAL circumstances have caused a long delay in the publication of the present volume, which, if their recurrence should not be prevented, may render the completion of the work, according to its original plan, very precarious. In the mean while, the number of volumes originally proposed is now finished, and the first 23 Classes are completed, as well as the first Order of the 24th, *Cryptogamia Filices*, the only one that required more study and emendation than it has hitherto received.

Of the remaining Orders, the *Musci* have been detailed in the Latin *Flora Britannica* and *Compendium* of the author, as well as in his *English Botany*; and by other well-known writers, in two editions of the *Muscologia Britannica*, and the *Muscologiæ Hibernicæ Spicilegium*. Still this beautiful and interesting tribe of plants might prove susceptible of much illustration to English readers, and of some improvements relative to generic distribution, on principles too little studied by the pursuers of superabundant discrimination, instead of philosophical combinations. This is the bane of natural science at the present day. Hence the *filum Ariadneum* is lost, or wilfully thrown away, and a bandage darkens the sight of the teacher no less than that of the student.

The monograph of Dr. Hooker on British *Junger-*

manniæ, which, with their allies, constitute the next Order to the *Musci*, diffuses a new light over the whole of that Order. The works of Mr. Dawson Turner on *Fuci*, and of Mr. Dillwyn on *Confervæ*, have gone far to exhaust the species of those tribes, an application of scientific principles to the settlement of their genera being all that is wanting. The *Lichen* family, under the controul of the great Acharius, assumes the dignity of an entire and well-arranged Order. The *Fungi*, better discriminated by Withering than by most popular writers, and well explained by the figures of the excellent and lamented Sowerby, are, in their minutest details, exquisitely illustrated by the *Cryptogamic Flora* of the ingenious Dr. Greville, and the accurate publications of Mr. Purton. These, marshalled by the aid of the learned Persoon and others, might possibly have proved less obscure than heretofore. This tribe indeed leads the botanist to the end of his clue, and leaves him in palpable darkness, where even Dillenius was bewildered.

All these subjects, if not yet brought into perfect daylight, might well, by the help of those brilliant northern lights, Acharius, Fries and Agardh, have been made more accessible to the student, and more instructive to systematic botanists, by one long accustomed to their contemplation in the wild scenes of Nature, and not unfurnished with remarks of his own. If our bodily powers could keep pace with our mental acquirements, the student of half a century

would not shrink from the delightful task of being still a teacher; nor does he resign the hope of affording some future assistance to his fellow-labourers, though for the present, “a change of study,” to use the expression of a great French writer, may be requisite “by way of relaxation and repose.”

The student of the Phænogamic Plants of Britain will, it is hoped, find this publication sufficient for his purpose. The numerous and very curious additions, received by the author during its progress, and announced at the end of the 23rd Class, encourage him to think the subject is far from exhausted, and to look for still more discoveries to enrich his future volumes whenever they may appear.

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